

Figure 1

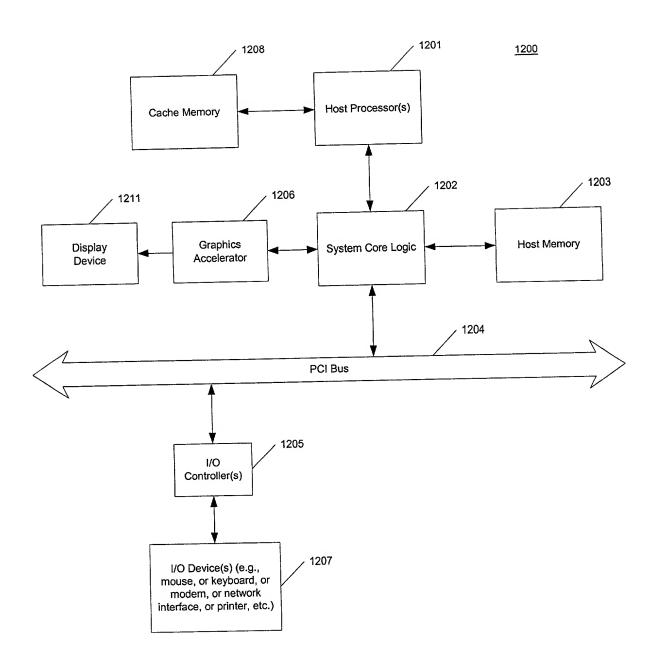


Figure 2

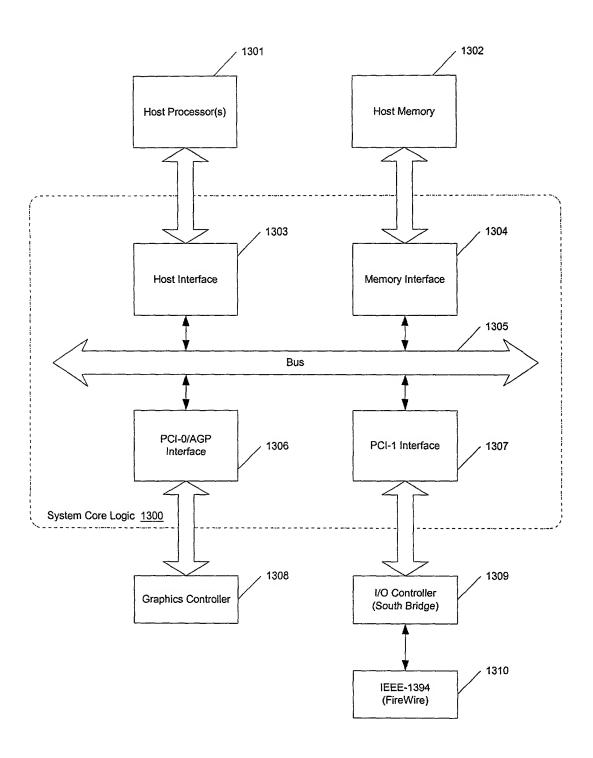


Figure 3

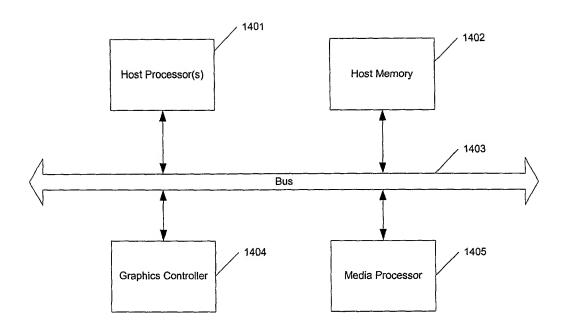


Figure 4A

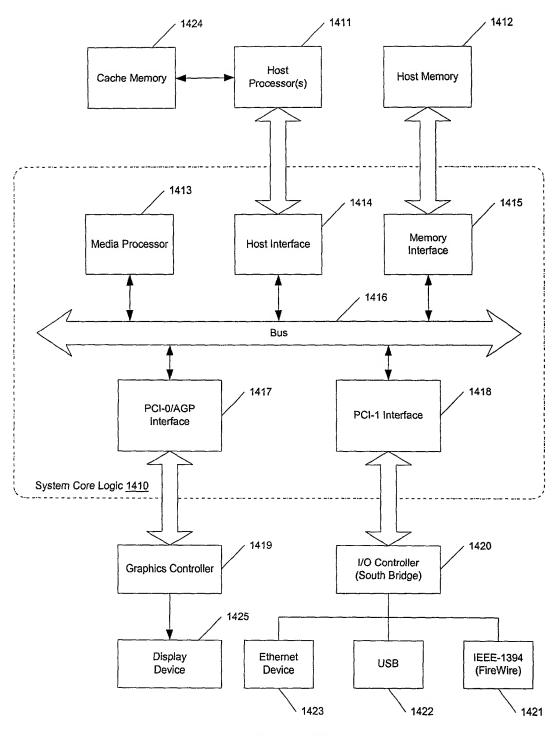


Figure 4B

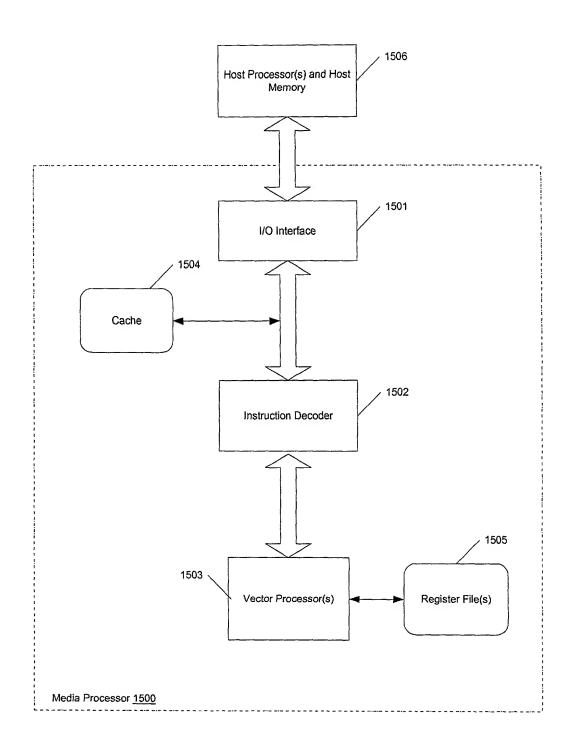


Figure 5A

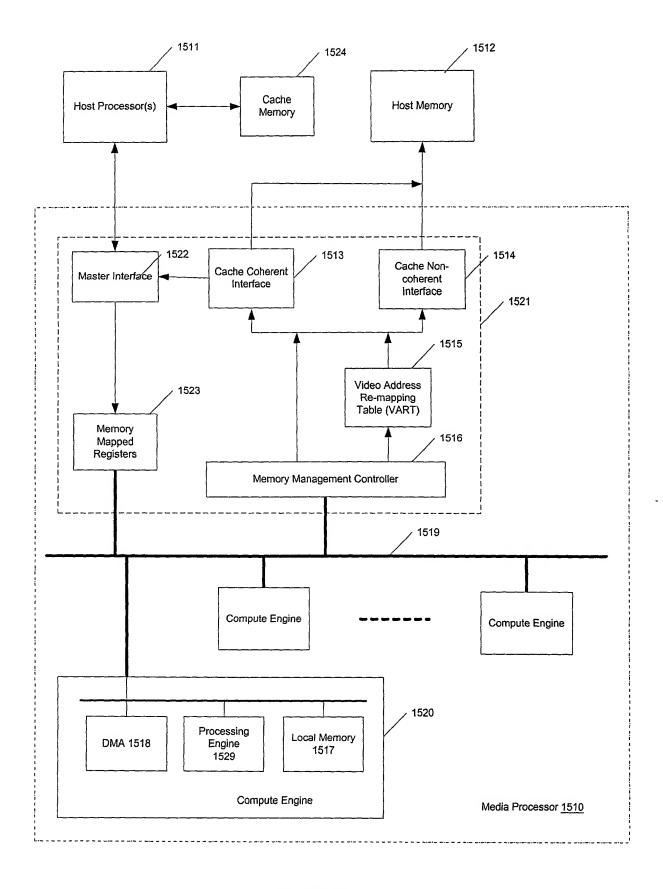


Figure 5B

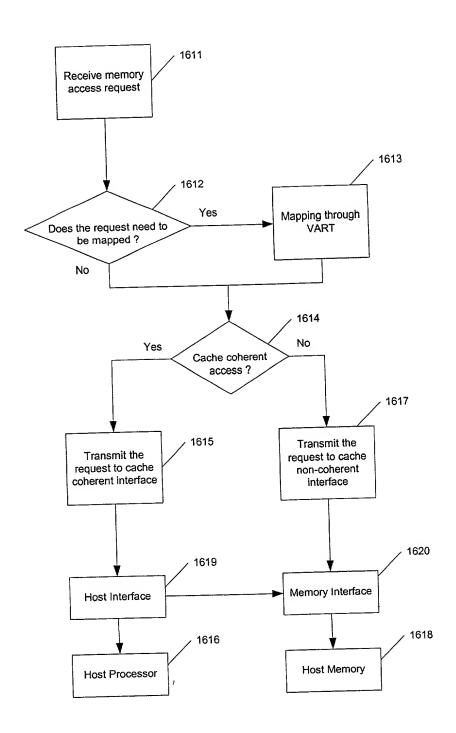
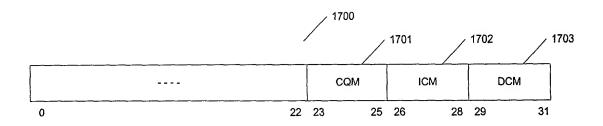


Figure 6



|      | 1704   |
|------|--|
|      | Memory Access Mode Code  |
| Code | Description  |
| 0    | Mapped   |
| 100  | Unmapped and coherent  |
| 101  | Unmapped and non-coherent  |
| 110  | if (LogicalAddress[0] = 0) then mapped else unmapped and coherent      |
| 111  | if (LogicalAddress[0] = 0 ) then mapped else unmapped and non-coherent |

Figure 7

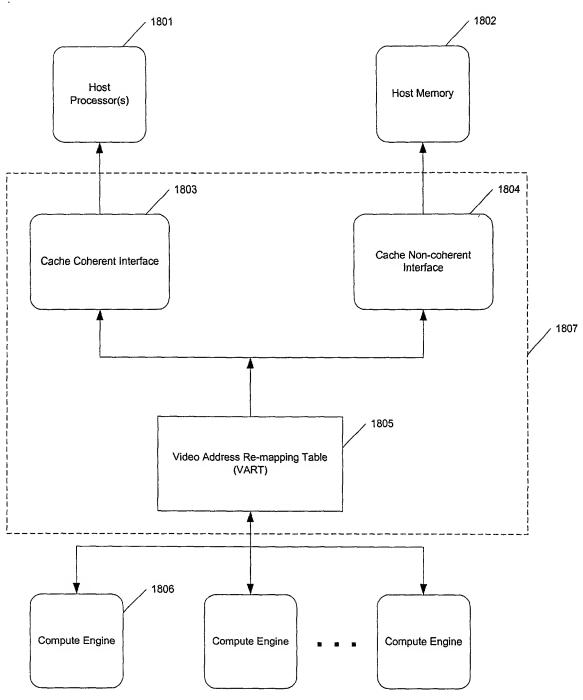
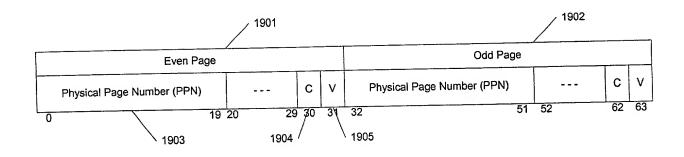
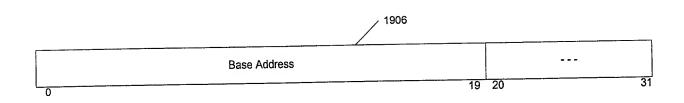


Figure 8





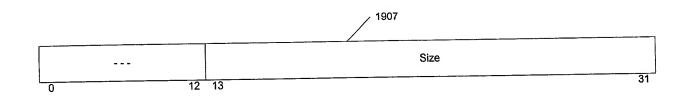


Figure 9

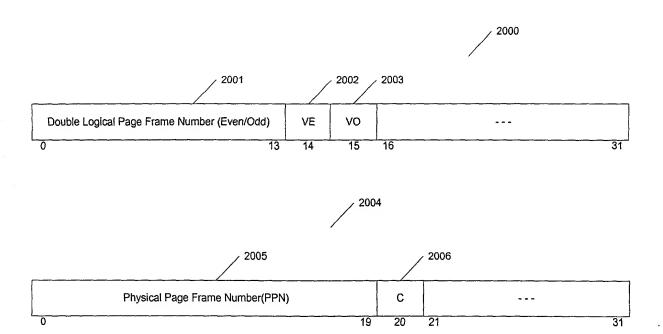


Figure 10A

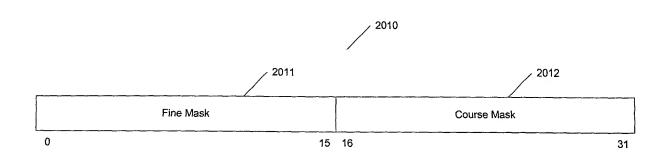


Figure 10B

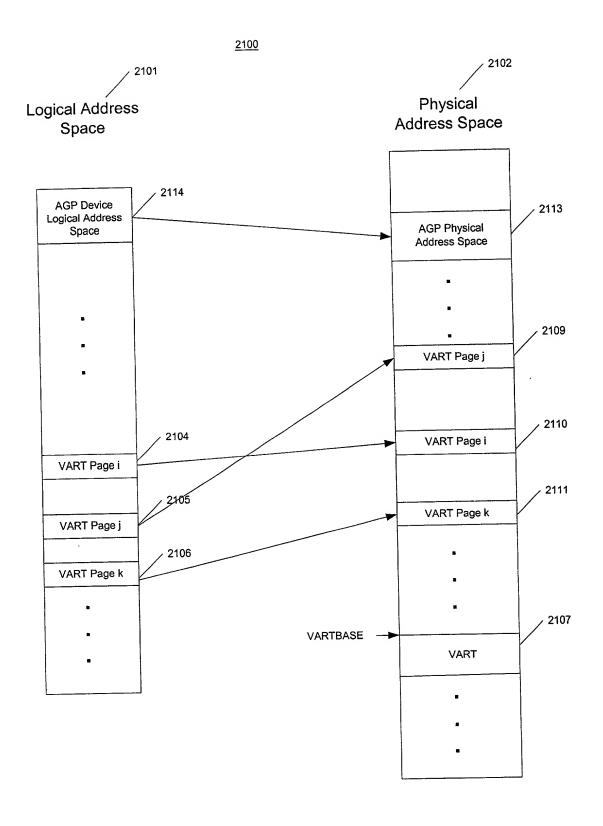


Figure 11

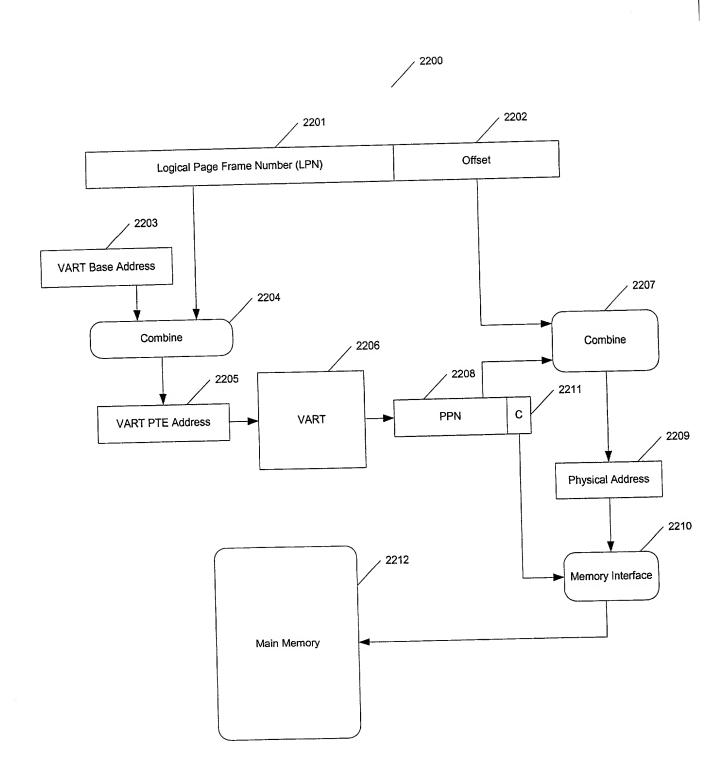


Figure 12

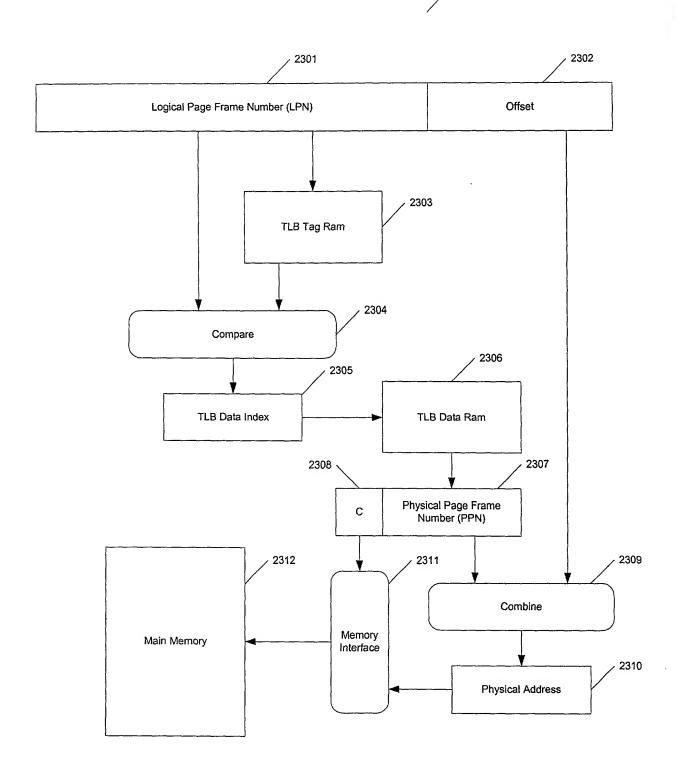


Figure 13

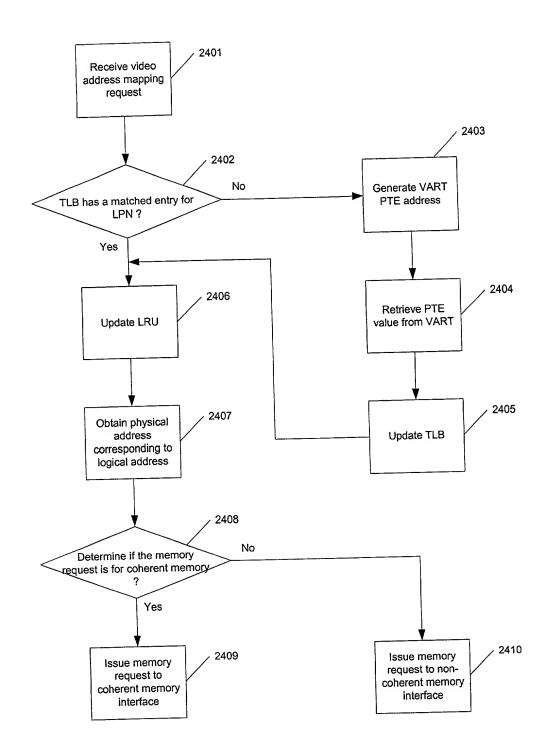


Figure 14

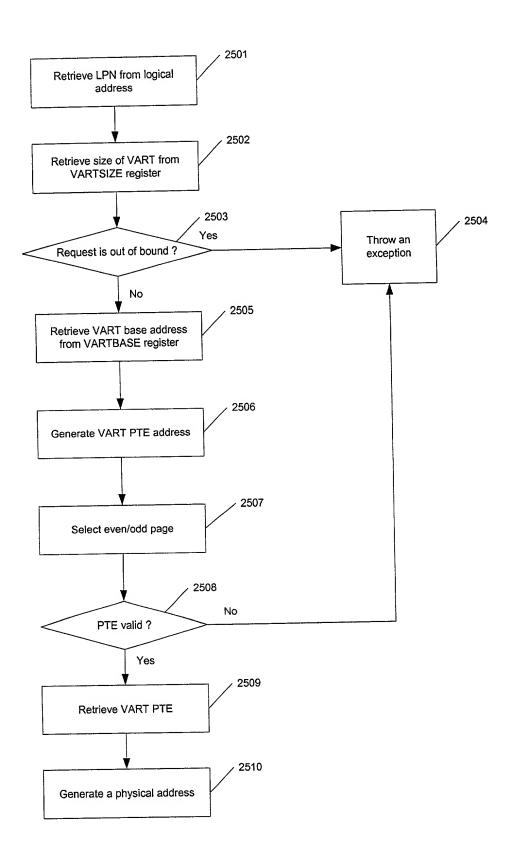
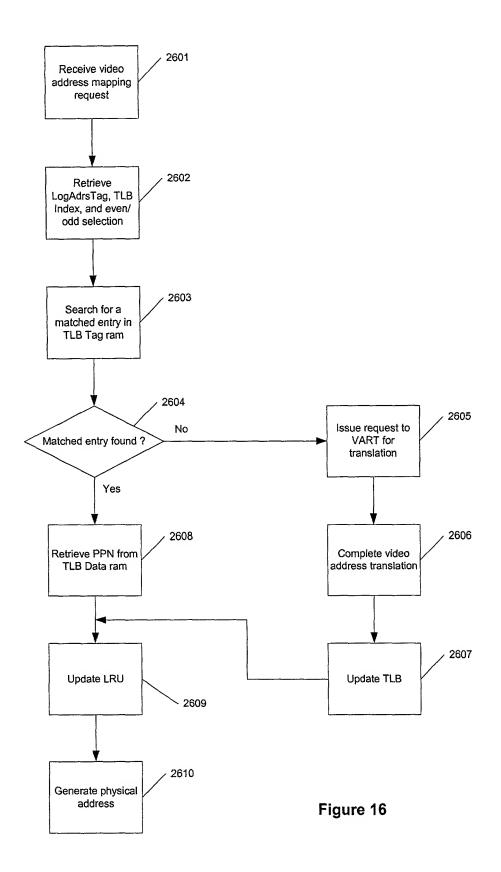
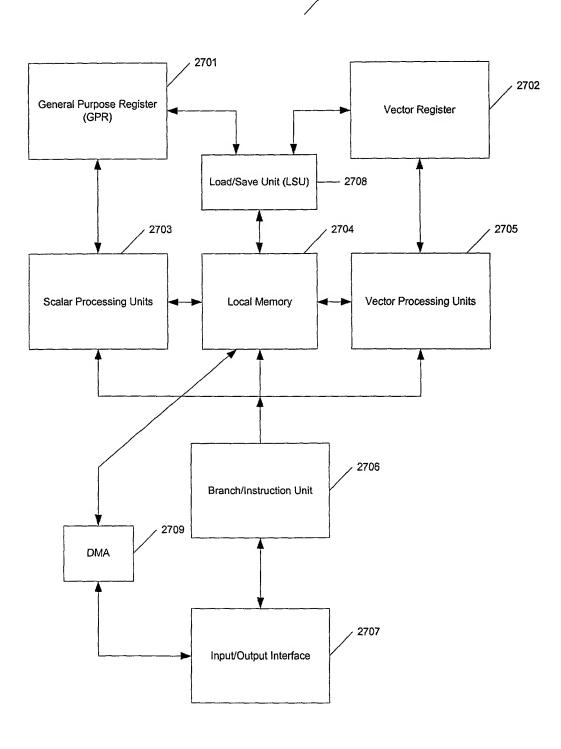


Figure 15





2700

Figure 17

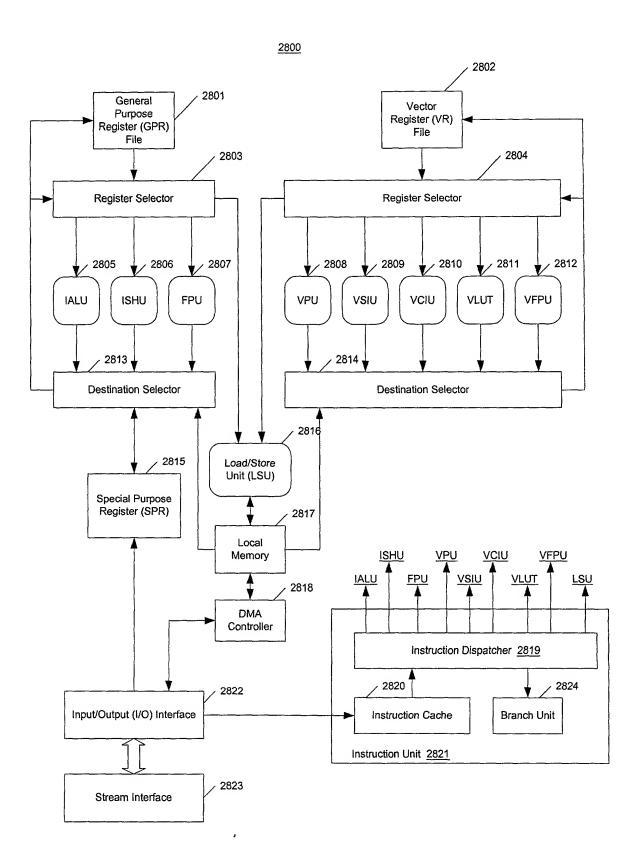


Figure 18

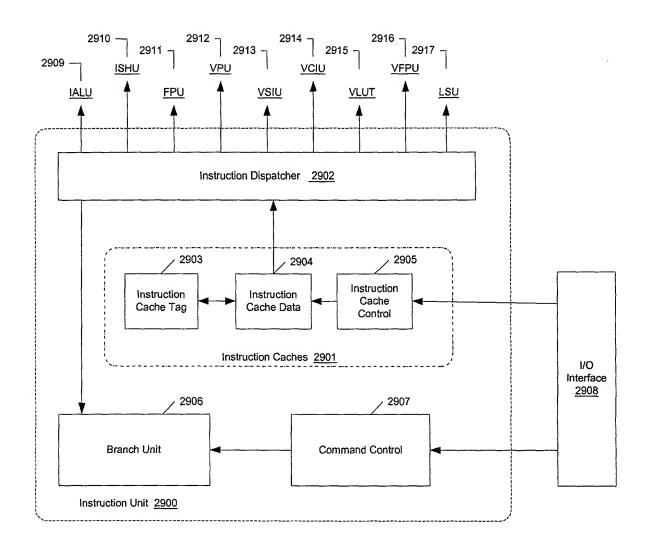


Figure 19A

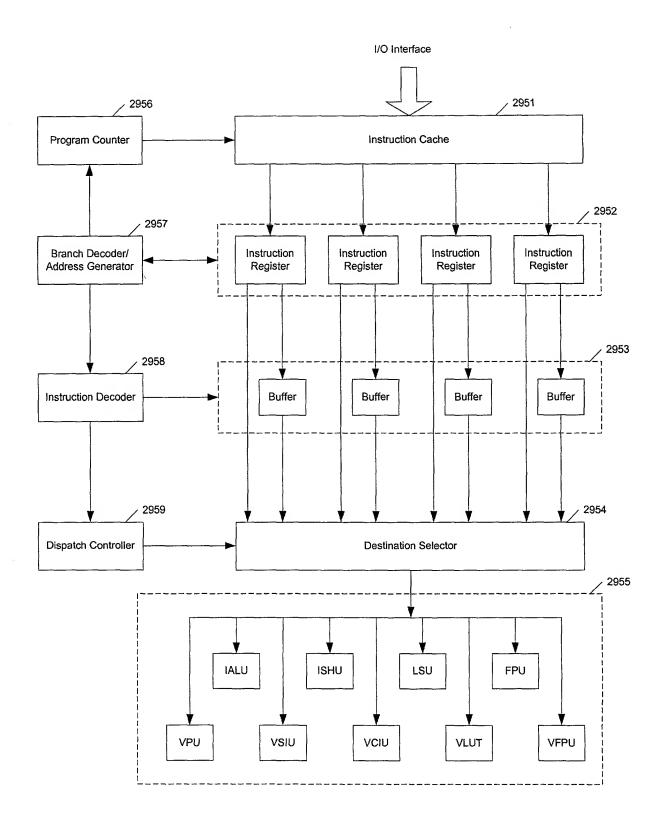


Figure 19B

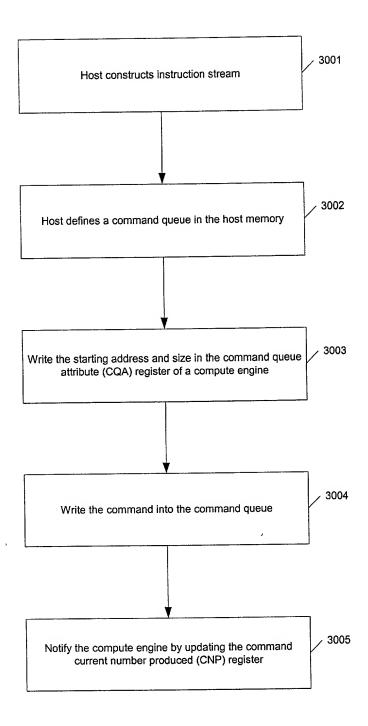


Figure 20A

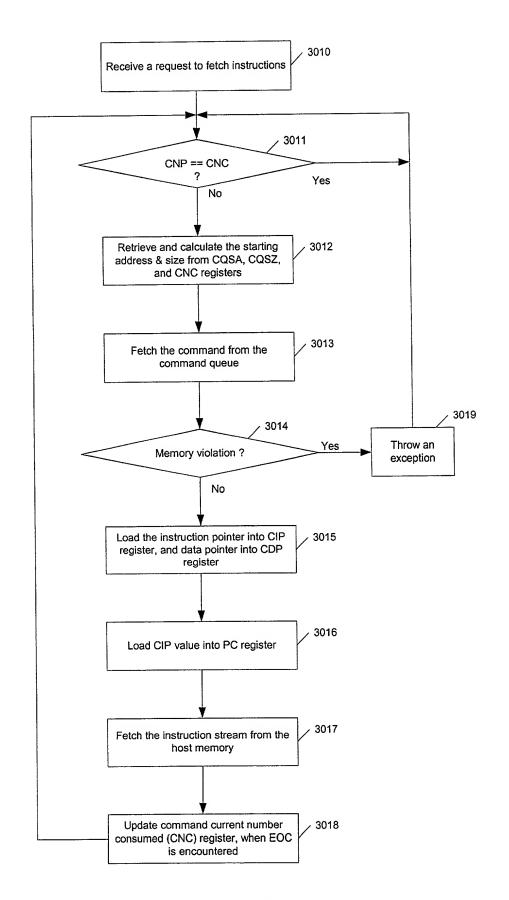


Figure 20B

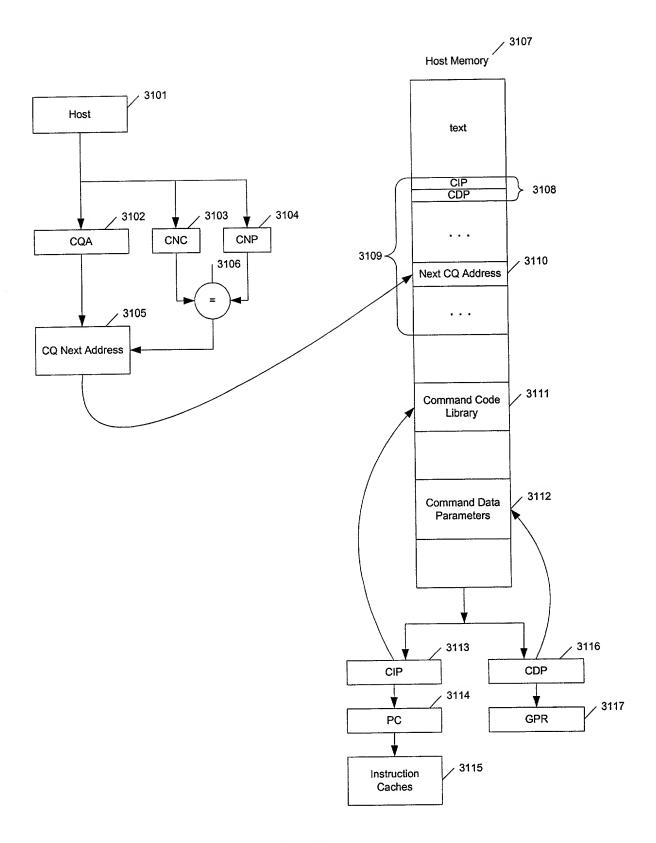


Figure 21

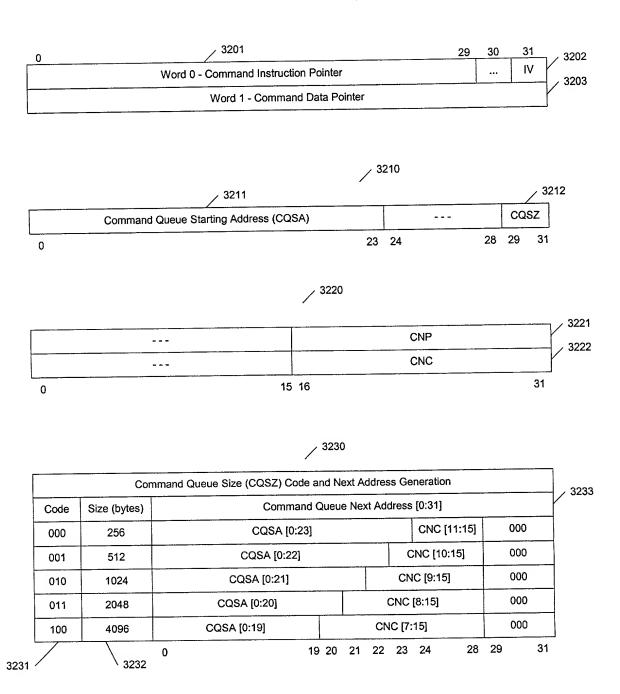


Figure 22

| Priority Number | Functional Group Name                  | 336 |
|-----------------|--|-----|
| 0               | IALU - Integer Arithmetic/Logical Unit |     |
| 1               | ISHU - Integer Shift Unit              |     |
| 2               | LSU - Load/Store Unit                  |     |
| 3               | VPU - Vector Permute Unit              |     |
| 4               | VSIU - Vector Simple Integer Unit      |     |
| 5               | VCIU - Vector Complex Integer Unit     |     |
| 6               | VLUT - Vector Look-up Table Unit       |     |
| 7               | BRU - Branch Unit                      | 33  |

Figure 23

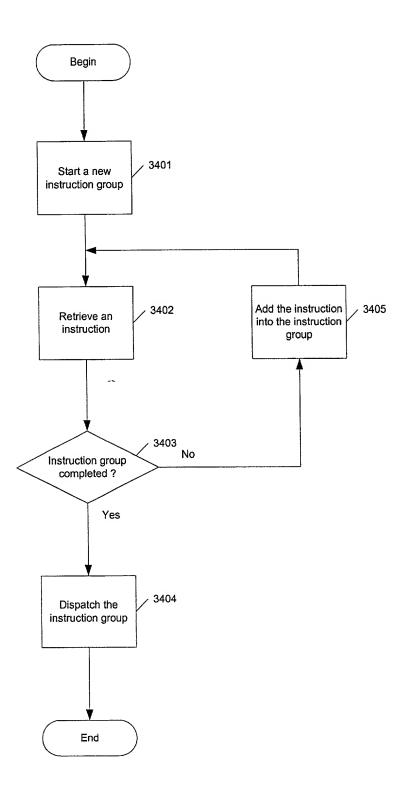


Figure 24

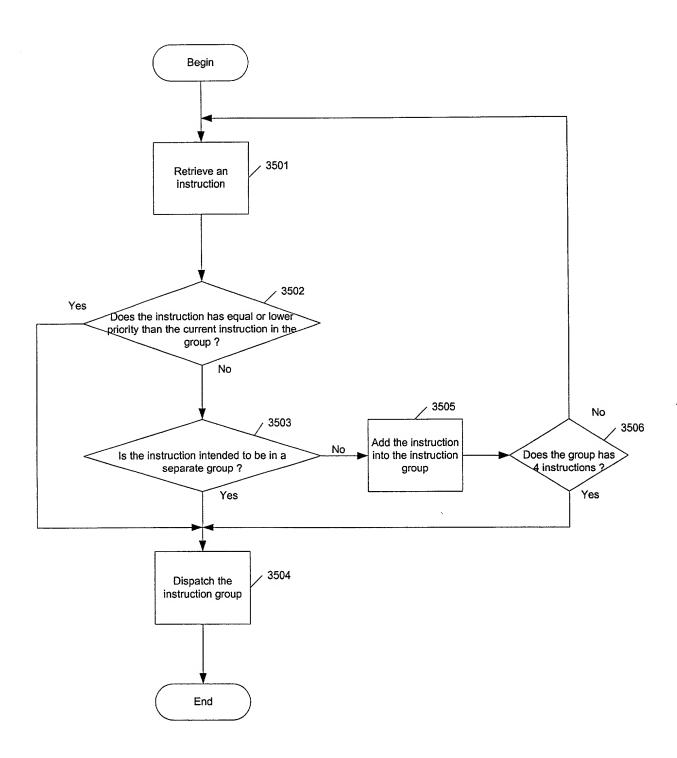


Figure 25

| Functional Unit                | Latency | Dispatch Rate |
|--------------------------------|---------|---------------|
| IALU - not multipy or divide   | 2       | 1             |
| IALU - multiply                | 19      | 19            |
| IALU - divide                  | 35      | 35            |
| ISHU                           | 2       | 1             |
| LSU - non-DMA address update   | 2       | 1 .           |
| LSU - non-DMA load data update | 3       | 1             |
| LSU - non-DMA store            | 1       | 1             |
| LSU - DMA instructions         | 1       | 1             |
| VPU                            | 2       | 1             |
| VSIU                           | 2       | 1             |
| VCIU                           | 6       | 1             |
| VLUT - reads, vvld             | 4       | 1             |
| VLUT - writes                  | 1       | 1             |
| Branch instruction             | 1       | 1             |

Figure 26

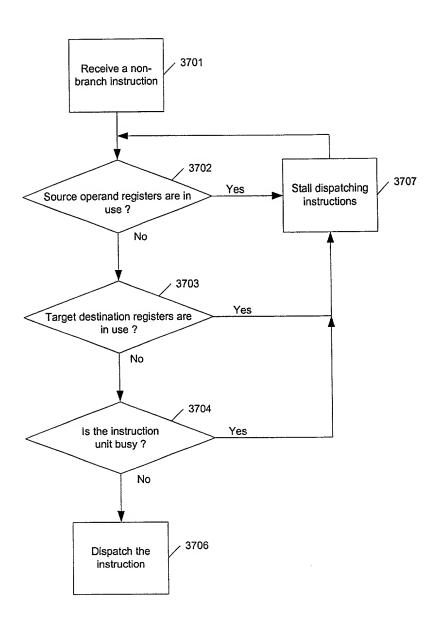


Figure 27

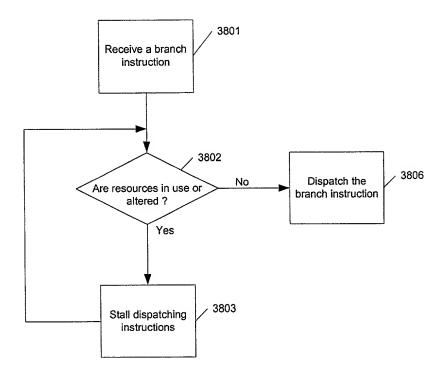


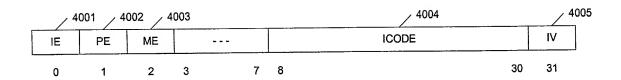
Figure 28

|   | Program Counter |    | PSt |    |
|---|-----------------|----|-----|----|
| 0 | 29              | 30 | 3   | 31 |

/ 3901

| Pst | Name  | Description  |
|-----|-------|--|
| 00  | ldle  | CQ counters are equal and no current command executing. Program counter is invalid.  |
| 01  | Run   | Command was executing. Program counter points to next instruction that would have been executed.   |
| 10  | lWait | Command was executing, but instruction fetching has stopped due to a previous exception. Program counter points to the next instruction that would have been executed. |
| 11  | CWait | Command was not executing due to an exception in fetching the command. Program counter is invalid.   |

Figure 29



**/** 4006

| Name  | Descriptions   |  |
|-------|--|--|
| ΙE    | Illegal Opcode Exception. Occurs whenever an illegal Opcode is fetched for execution. Cleared when read by the host.             |  |
| PE    | Program Counter Exception. Occurs whenever the host does a read program counter with exception. Cleared with read by host.       |  |
| ME    | Memory Access Exception. Occurs whenever a memory operation results in a memory access exception. Cleared when read by the host. |  |
| ICODE | Interrupt Code. Can be read and written by a compute engine or the host.   |  |
| IV    | Interrupt Valid. Set and read by the compute engine to indicate and interrupt to the host. Read and cleared by the host.         |  |

Figure 30

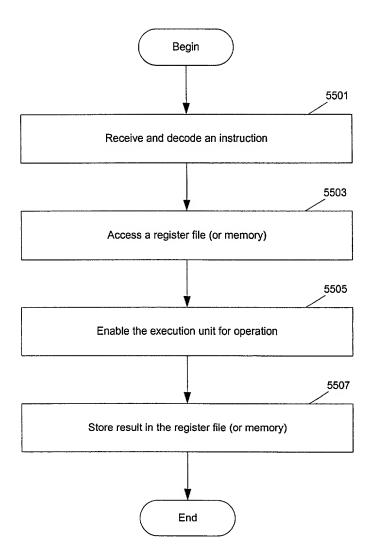


Fig. 31

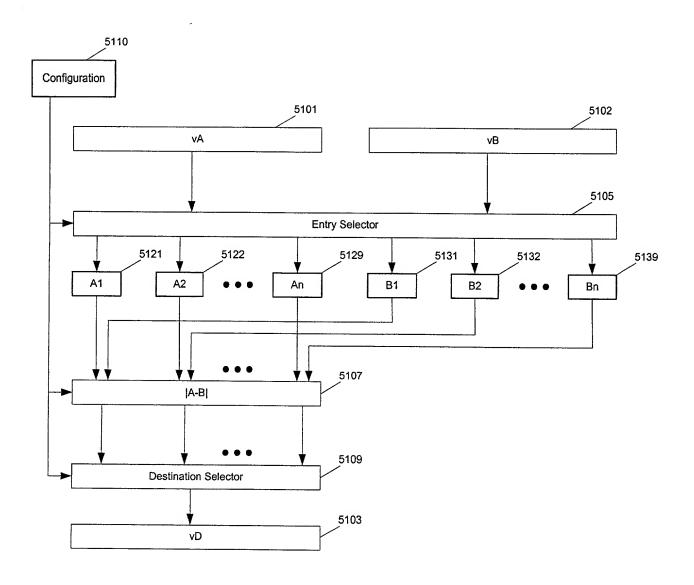


Fig. 32

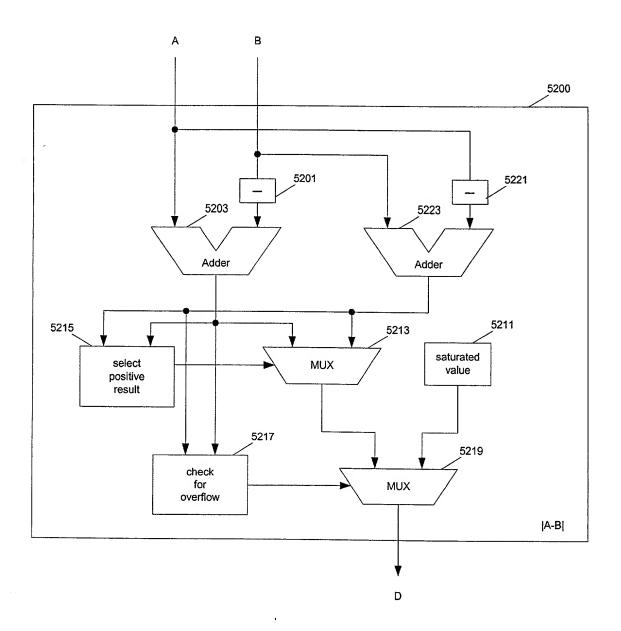
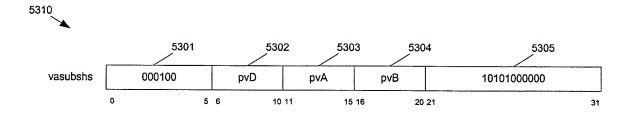


Fig. 33



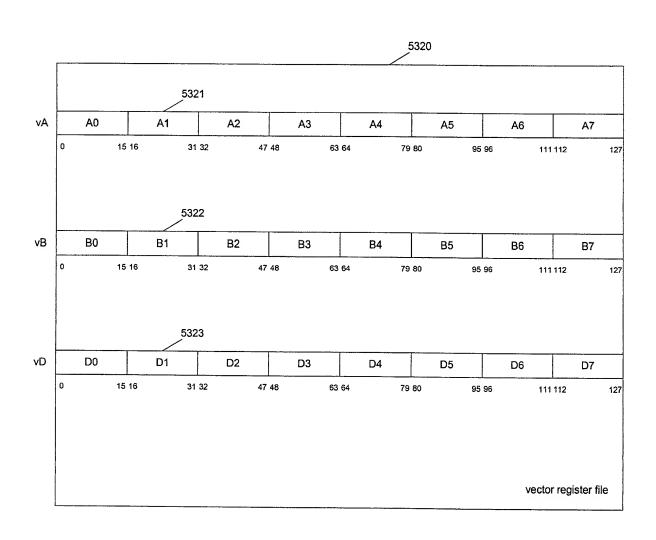


Fig. 34

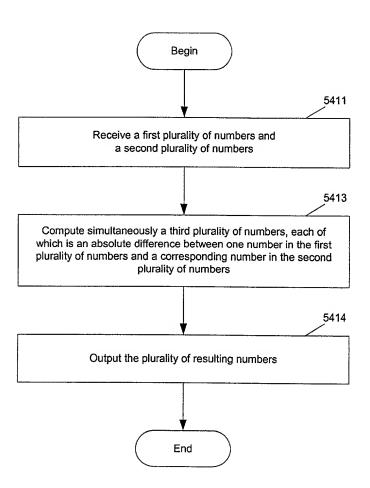


Fig. 35

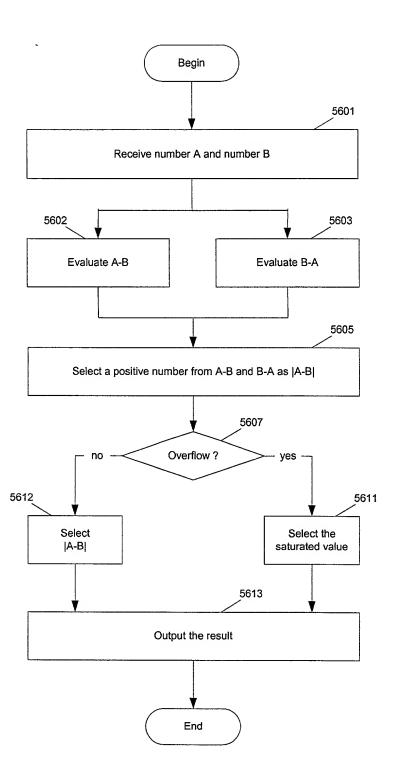


Fig. 36

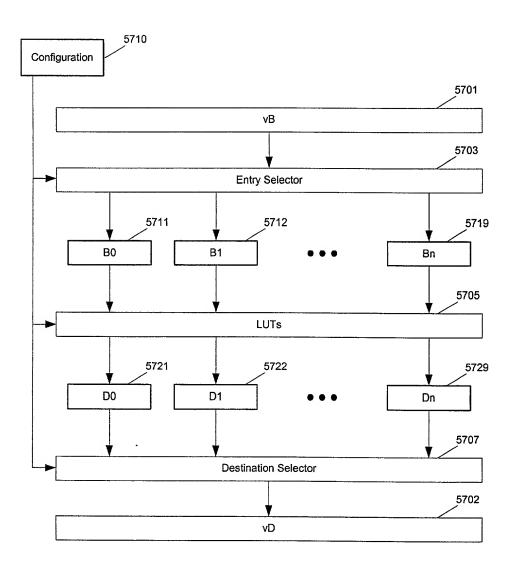


Fig. 37

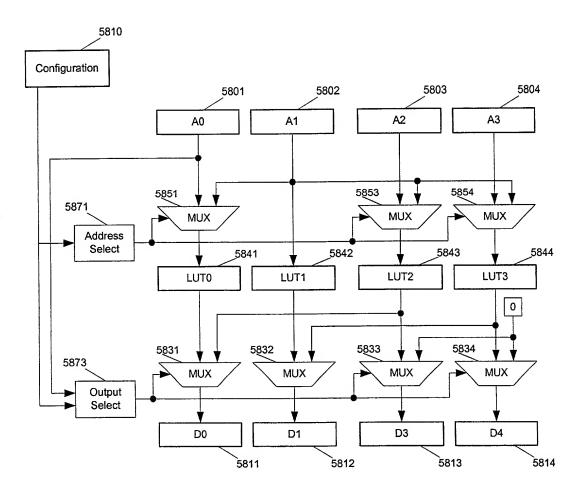


Fig. 38

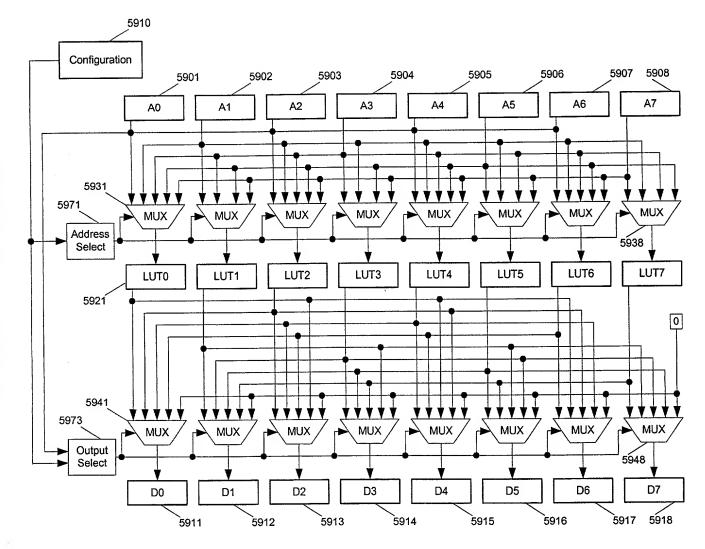
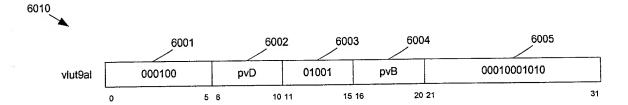
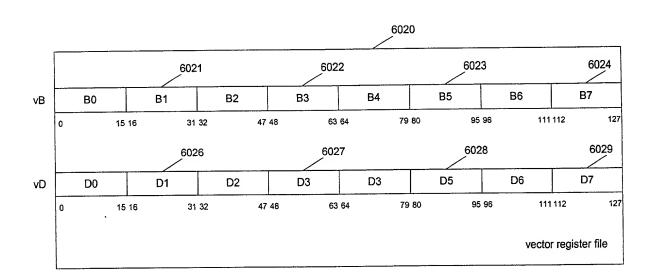


Fig. 39





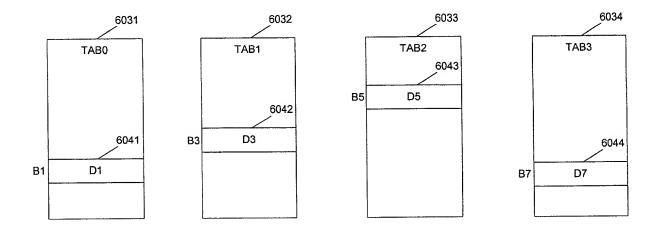


Fig. 40

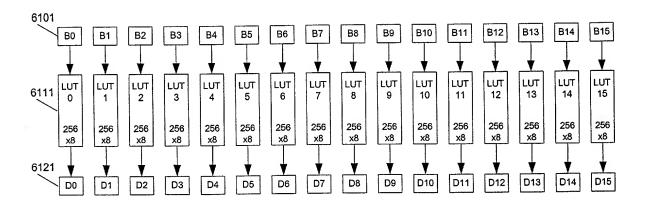


Fig. 41

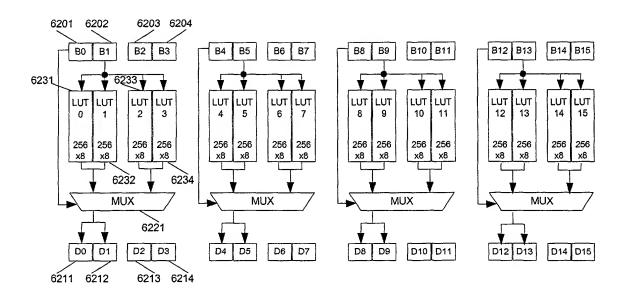


Fig. 42

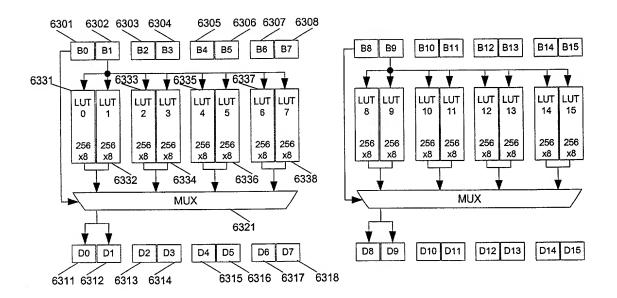


Fig. 43

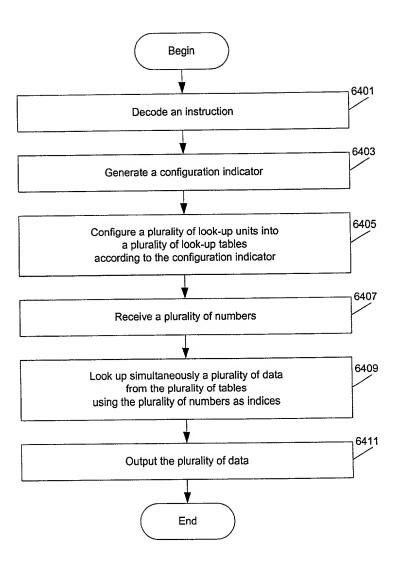


Fig. 44

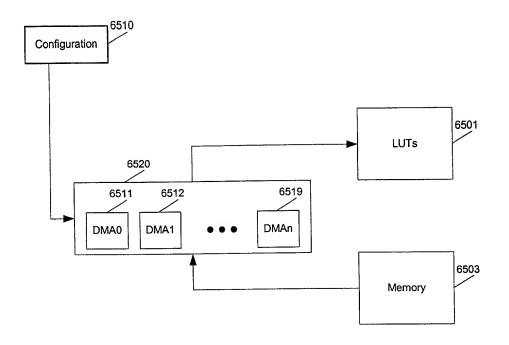
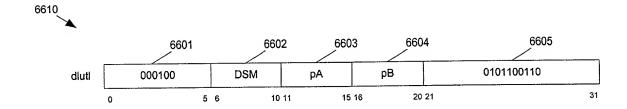
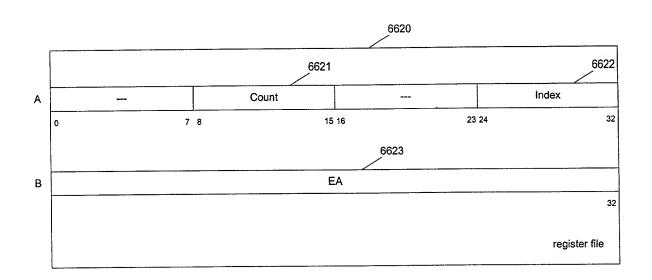


Fig. 45





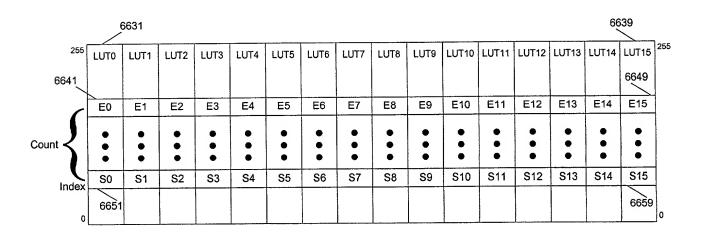


Fig. 46

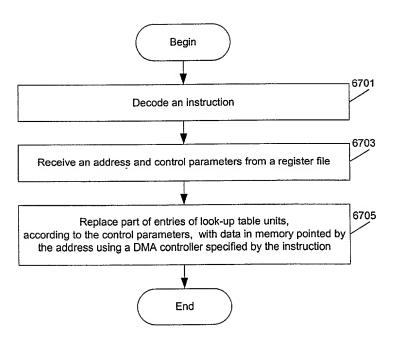


Fig. 47

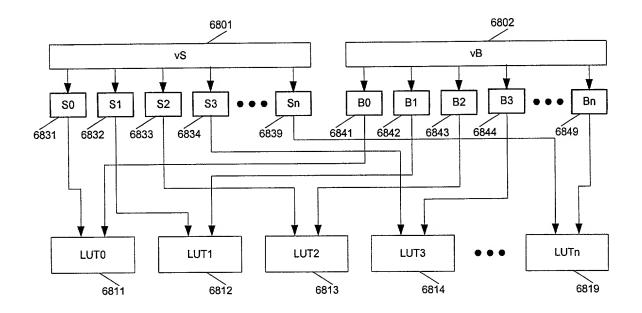
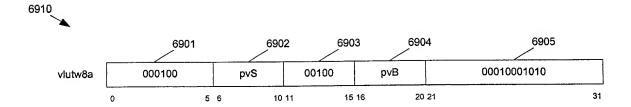
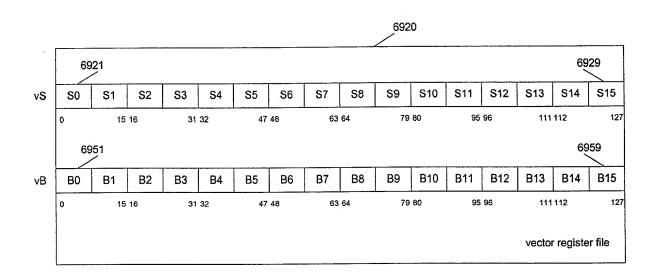


Fig. 48





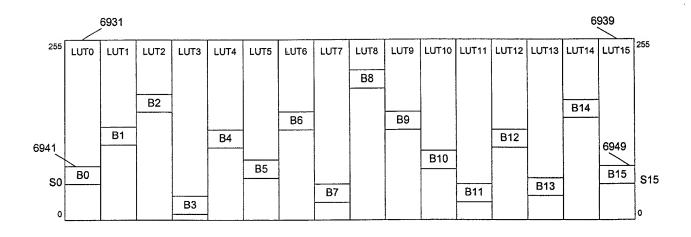


Fig. 49

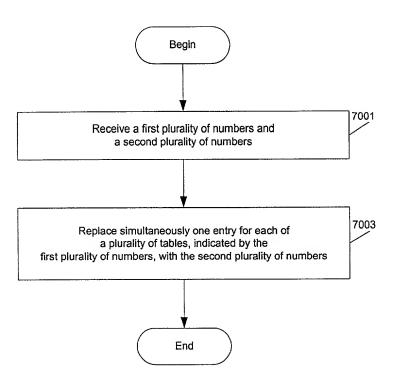


Fig. 50

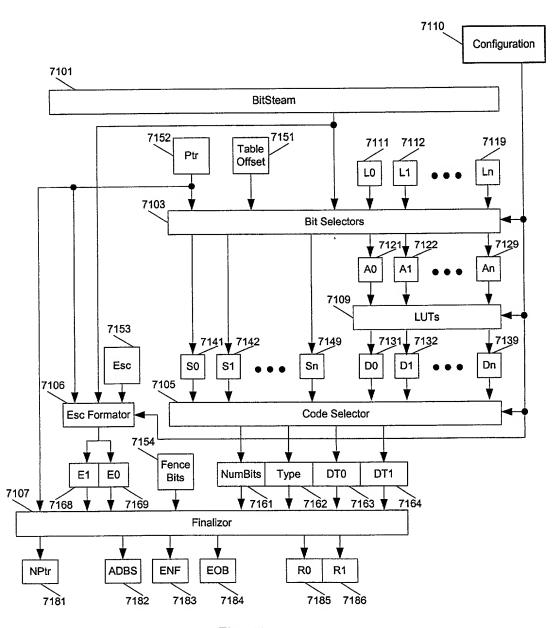


Fig. 51

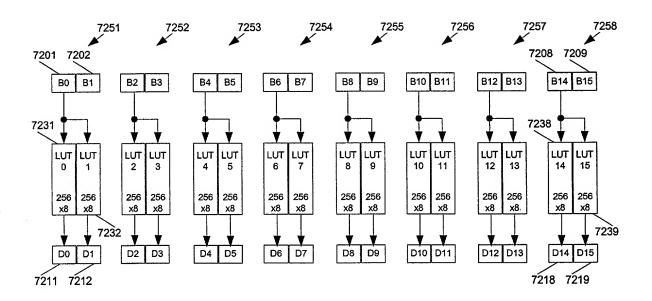


Fig. 52

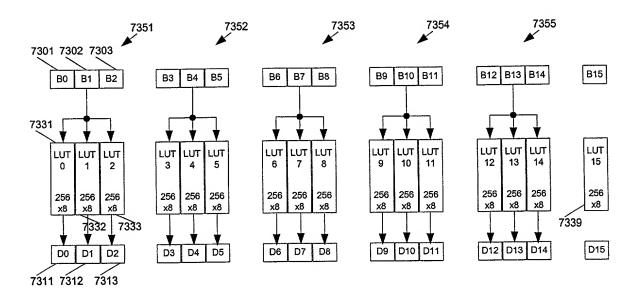


Fig. 53

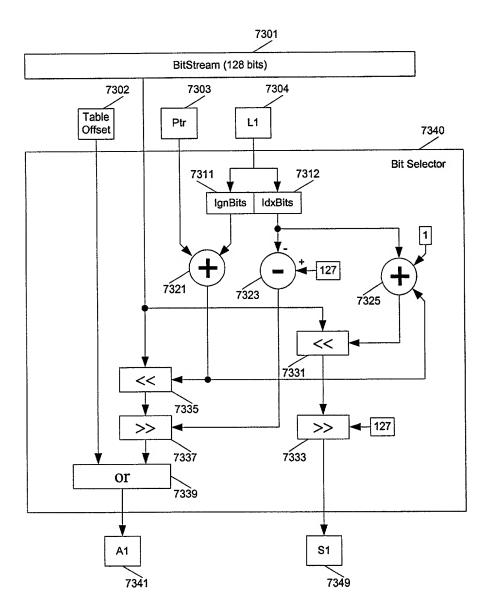


Fig. 54

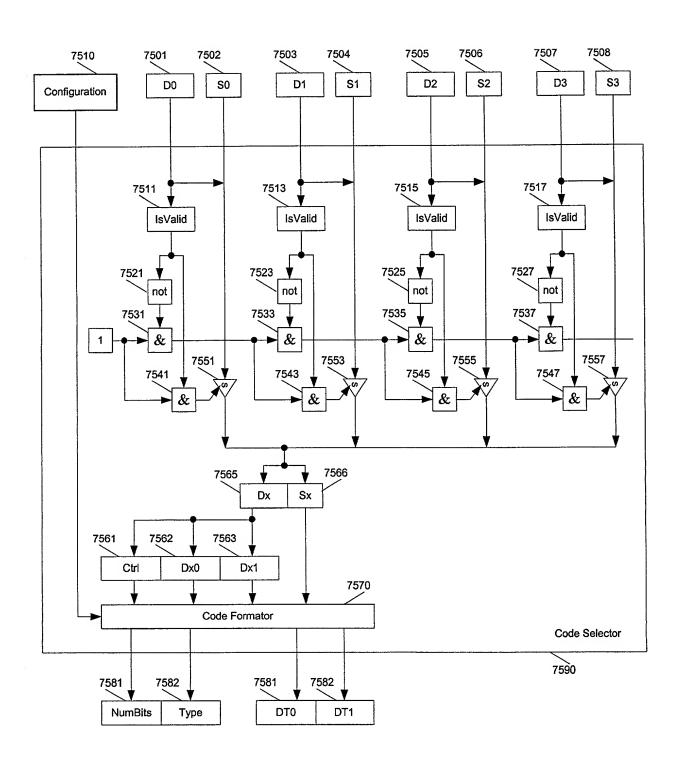


Fig. 55

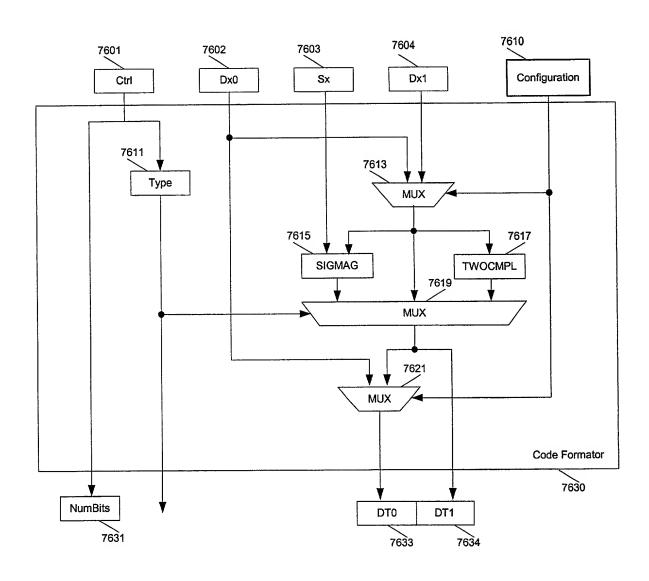


Fig. 56

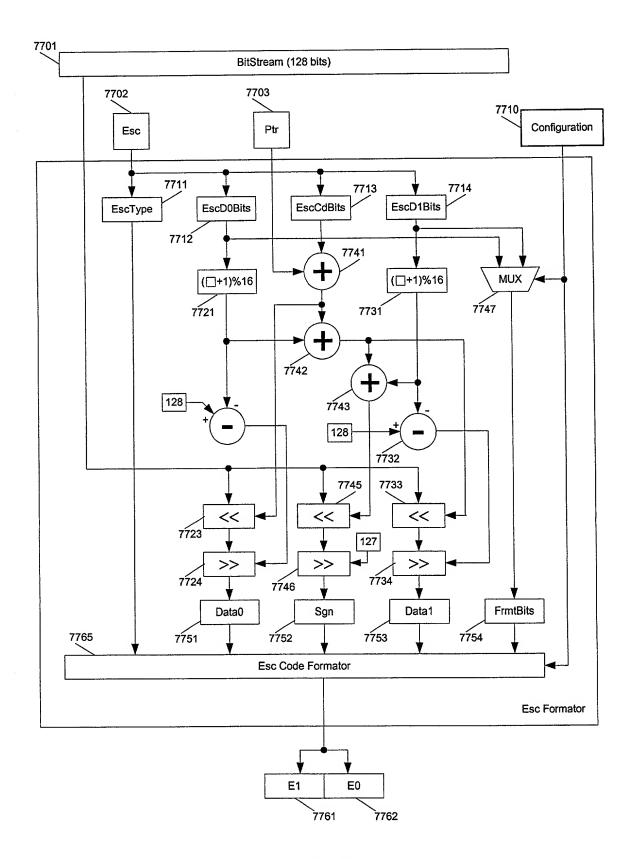


Fig. 57

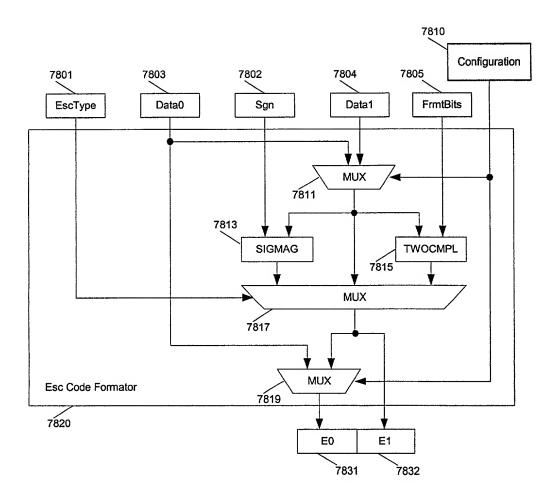


Fig. 58

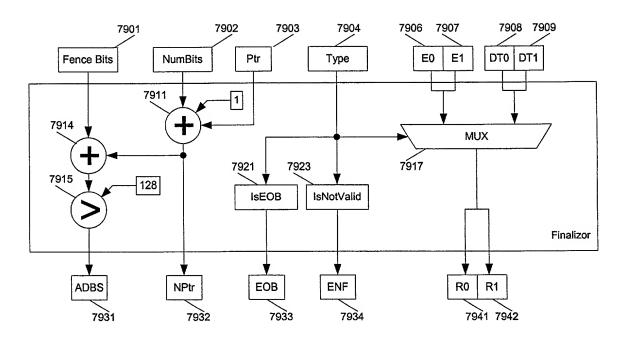


Fig. 59

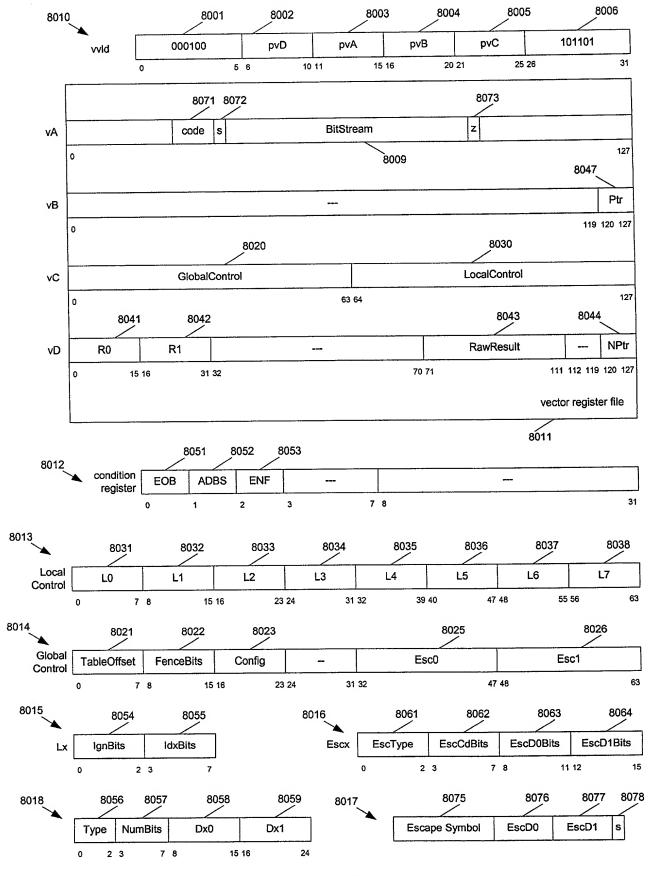


Fig. 60

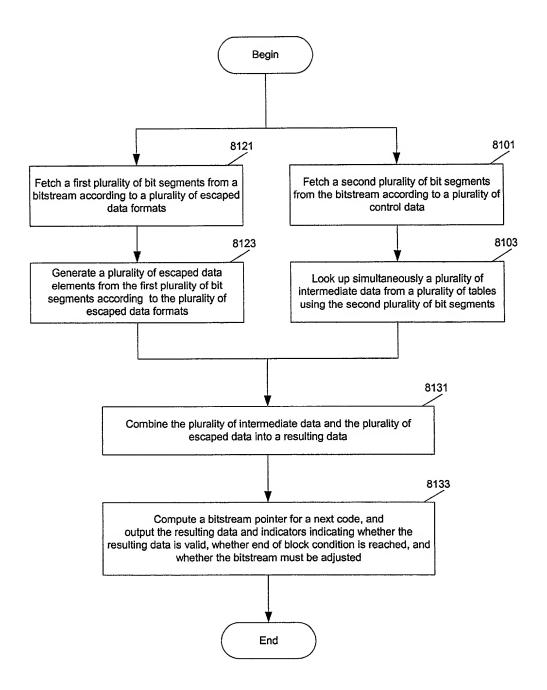


Fig. 61

| Index   Tr   |       | r · · · · · · · · · · · · · · · · · · · |   |   |              |                |    | 2 | 1           |      | T | 3            |             |             | T.          | 4 |               |
|--|-------|---|---|---|--------------|----------------|----|---|-------------|------|---|--------------|-------------|-------------|-------------|---|---------------|
| Online   | Index | tyne                                    |   | · | level        | type           |    |   | levei       | type |   |              | level       | type        |             |   | level         |
| OT   | 00    |   |   |   |              |                |    |   |             |      | 9 | 11           |             |             |             |   |               |
| 03   |       |   |   |   |              | 4              | 6  |   |             |      |   |              |             |             |             |   |               |
| 00   | 02    | 4                                       |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| 06   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| OB   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| 000  |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| 10   |       |   |   |   |              |                |    |   |             |      |   |              |             | 4           | 10          |   |               |
| OB   |       |   |   |   |              |                |    |   | 7           | 4    | 9 |              |             |             |             |   |               |
| OB   |       |   | 2 |   | -1           |                |    |   |             |      |   |              |             |             |             |   | 5             |
| Oc.  | 0a    |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| Oct  |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| OB   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| OT   |       | <del></del>                             |   |   |              |                |    |   |             |      |   |              |             |             |             | 2 | -6            |
| 10   |       | H                                       |   |   |              |                |    |   |             |      |   |              |             | 4           | 10          | 2 |               |
| 11   |       |   |   |   |              |                | 7  | 5 | 1           | 4    |   |              |             |             |             |   |               |
| 12   | 11    |   | 3 | 0 | 2            | 4              |    |   |             |      |   | 2            |             |             |             |   |               |
| 14   | 12    |   | 3 |   |              |                |    |   |             |      |   |              |             | #           |             |   |               |
| 15   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| 16   |       | 1                                       |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| 177   4   3   0   -2   4   7   1   -3   4   9   0   -18   4   10   1   -10     18  |       |   |   |   |              |                |    |   |             |      |   |              |             | -           |             |   |               |
| 18   |       | ()                                      |   |   | -2           |                |    |   |             |      |   |              |             | <del></del> |             | 1 |               |
| 19   |       | 1                                       |   |   |              |                |    |   |             |      | 9 |              |             | -           |             |   |               |
| 15   |       |   | 3 | 0 | 0            |                |    |   |             |      |   |              |             |             |             |   |               |
| 10   |       |   |   |   |              |                |    |   | <del></del> |      |   |              |             |             | <del></del> |   |               |
| 10   |       |   |   |   | <u> </u>     |                |    |   |             | -    |   |              |             |             |             |   |               |
| 10   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| 1ft         4         4         1         -1         4         7         0         -11         4         9         0         -22         4         10         1         0           20         4         4         0         3         5         8         7         1         0         0         0         4         11         6         -3           21         4         4         0         -3         5         8         8         1         0         0         0         0         4         11         6         -3           22         4         4         0         -3         5         8         9         1         0         0         0         0         4         11         4         4           23         4         4         0         -3         5         8         9         1         0         0         0         0         4         11         4         4           24         4         0         -4         5         8         4         2         0         0         0         0         4         11         1         12      <  |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| 20   |       |   |   |   |              |                |    | 1 |             |      |   |              |             | -           |             | 1 |               |
| 21         4         4         0         3         5         8         8         1         0         0         0         0         4         11         6         -3           22         4         4         0         -3         5         8         9         1         0         0         0         4         11         4         4           23         4         4         0         -3         5         8         10         1         0         0         0         0         4         11         4         4           24         4         4         0         4         5         8         3         2         0         0         0         0         4         11         3         -6           25         4         4         0         -4         5         8         1         5         0         0         0         0         4         11         1         12           26         4         4         0         -4         5         8         1         5         0         0         0         0         4         11         1         13   |       |   |   |   |              |                |    | 7 |             | 0    |   |              |             |             |             |   |               |
| 23   | 21    |   | 4 | 0 |              |                |    |   |             |      |   |              |             |             |             |   |               |
| 24   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| 25   |       |   |   |   |              |                |    |   |             | 1    |   |              |             |             |             |   |               |
| 26   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| 27         4         4         0         -4         5         8         1         5         0         0         0         0         4         11         1         -12           28         4         5         2         1         5         8         1         6         0         0         0         0         4         11         1         13           29         4         5         2         -1         5         8         1         7         0         0         0         0         4         11         1         -13           2a         4         5         1         -2         5         8         0         12         0         0         0         0         4         11         1         -14           2b         4         5         0         5         5         8         0         14         0         0         0         0         4         11         1         -14           2c         4         5         0         6         5         8         0         15         0         0         0         0         4         11         3   |       |   |   |   | <del> </del> |                |    |   |             |      |   |              |             |             |             |   | 12            |
| 28         4         5         2         1         5         8         1         6         0         0         0         4         11         1         13           29         4         5         2         -1         5         8         1         7         0         0         0         0         4         11         1         -13           2a         4         5         1         2         5         8         0         12         0         0         0         0         4         11         1         -14           2b         4         5         1         -2         5         8         0         13         0         0         0         4         11         1         -14           2c         4         5         0         -5         5         8         0         14         0         0         0         4         11         3         0           2c         4         5         0         -6         5         8         0         17         0         0         0         4         11         4         0           30  |       |   | + | 1 |              |                |    |   |             | 0    | 0 | 0            | 0           | 4           |             |   |               |
| 2a         4         5         1         2         5         8         0         12         0         0         0         4         11         1         14           2b         4         5         1         -2         5         8         0         13         0         0         0         0         4         11         1         -14           2c         4         5         0         5         5         8         0         14         0         0         0         0         4         11         1         -14           2c         4         5         0         -5         5         8         0         15         0         0         0         4         11         1         -14           2c         4         5         0         -6         5         8         0         16         0         0         0         0         4         11         4         0           2d         4         5         0         -6         5         8         0         17         0         0         0         4         11         4         0 <th< td=""><td>28</td><td>4</td><td>5</td><td>2</td><td></td><td></td><td>+</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>13</td></th<>                                      | 28    | 4                                       | 5 | 2 |              |                | +  |   |             |      |   |              |             |             |             |   | 13            |
| 2b   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| 2c   |       |   |   |   | 2            |                |    |   |             |      |   | <del>-</del> |             |             |             |   |               |
| 2d   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   |               |
| 2e         4         5         0         6         5         8         0         16         0         0         0         4         11         4         0           2f         4         5         0         -6         5         8         0         17         0         0         0         4         11         4         0           30         0         0         0         0         0         0         0         0         0         0         0         0         4         11         4         0           30         0 <th< td=""><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td></th<>                           |       |   |   | 1 |              |                |    |   |             |      |   |              |             |             |             |   | 0             |
| 2f         4         5         0         -6         5         8         0         17         0         0         0         4         11         5         0           30         0 <td></td> <td></td> <td></td> <td></td> <td>6</td> <td>5</td> <td>8</td> <td>0</td> <td>16</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> |       |   |   |   | 6            | 5              | 8  | 0 | 16          | 0    | 0 |              |             |             |             |   |               |
| 32         0   | 2f    | 4                                       | 5 |   | -6           | 5              | 1  |   |             |      |   |              |             |             |             |   |               |
| 32         0   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   | $\frac{2}{2}$ |
| 34         0   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   | 2             |
| 34         0   |       |   | 1 |   |              |                |    |   |             |      |   | <del></del>  |             |             |             |   | 2             |
| 35         0   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   | 3             |
| 36         0   |       |   |   | 1 |              |                |    |   | 0           | 0    | 0 | 0            | 0           | 5           | 12          | 8 | 3             |
| 38         0   | 36    | 0                                       | 0 |   |              | 0              |    |   |             |      |   |              |             |             |             |   | 5             |
| 39         0   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   | 7             |
| 3a         0   |       |   |   |   |              |                |    |   |             |      |   |              |             |             |             |   | / /           |
| 3b         0   |       |   |   |   |              | 1—             |    |   |             |      |   |              |             |             |             |   | 9             |
| 3c         0   |       |   |   | - |              |                |    |   |             |      |   | <del></del>  |             |             |             |   |               |
| 3d         0         0         0         0         2         12         0         0         0         0         0         0         5         12         1         15           3e         0         0         0         0         0         0         0         0         0         0         0         5         12         1         16           3f         0         0         0         0         0         0         0         0         0         0         5         12         1         17           40         0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>12</td><td>2</td><td>11</td></t<>                         |       |   |   |   |              |                |    |   |             |      |   |              |             |             | 12          | 2 | 11            |
| 3e         0         0         0         3         15         0         0         0         0         0         5         12         1         16           3f         0 <td></td> <td></td> <td></td> <td></td> <td>0</td> <td>2</td> <td>12</td> <td></td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>    |       |   |   |   | 0            | 2              | 12 |   | 0           |      |   |              |             |             |             |   |               |
| 40           | 3e    | 0                                       |   |   |              |                |    |   |             |      |   |              | <del></del> |             |             |   |               |
| 0 0 0 0 0 0 0 0 0 0 0 0 0  |       |   |   |   |              | <del>   </del> |    | 4 |             |      |   |              |             |             |             |   |               |
|  | _     |   | + |   |              | <del></del>    |    |   |             |      |   |              |             |             |             |   |               |
|  |       |   |   | 1 |              |                |    |   |             |      |   |              |             |             |             |   | 0             |

Fig. 62

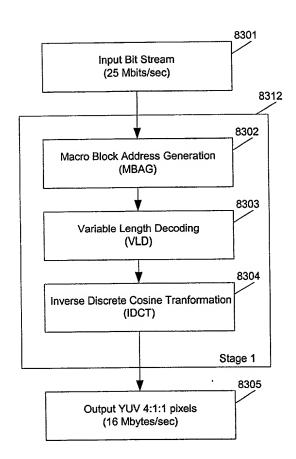


Fig. 63

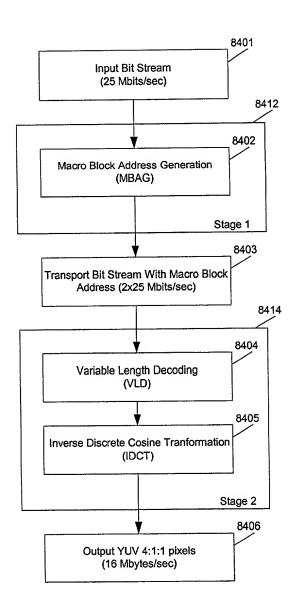


Fig. 64

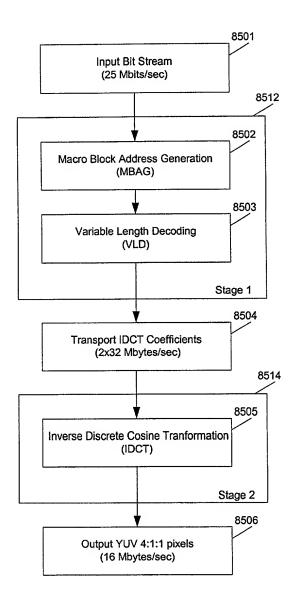


Fig. 65

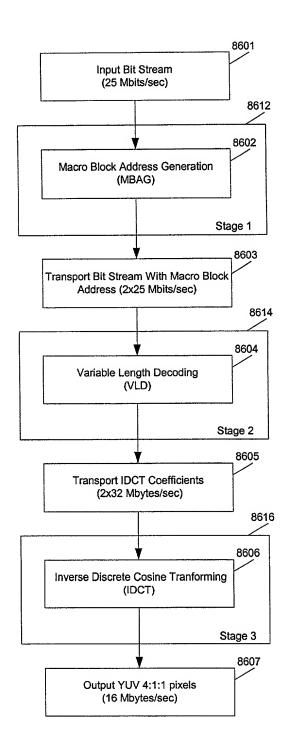


Fig. 66

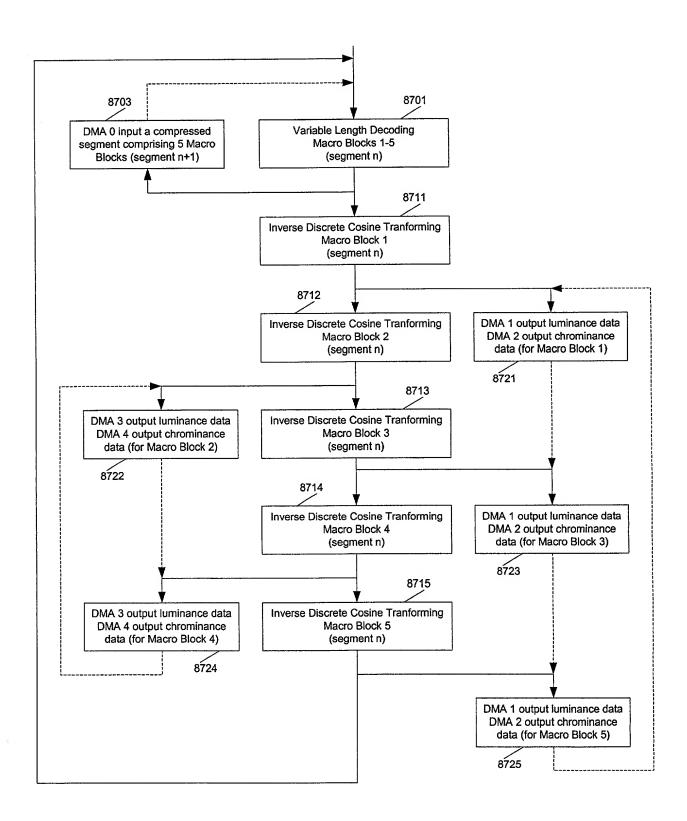


Fig. 67

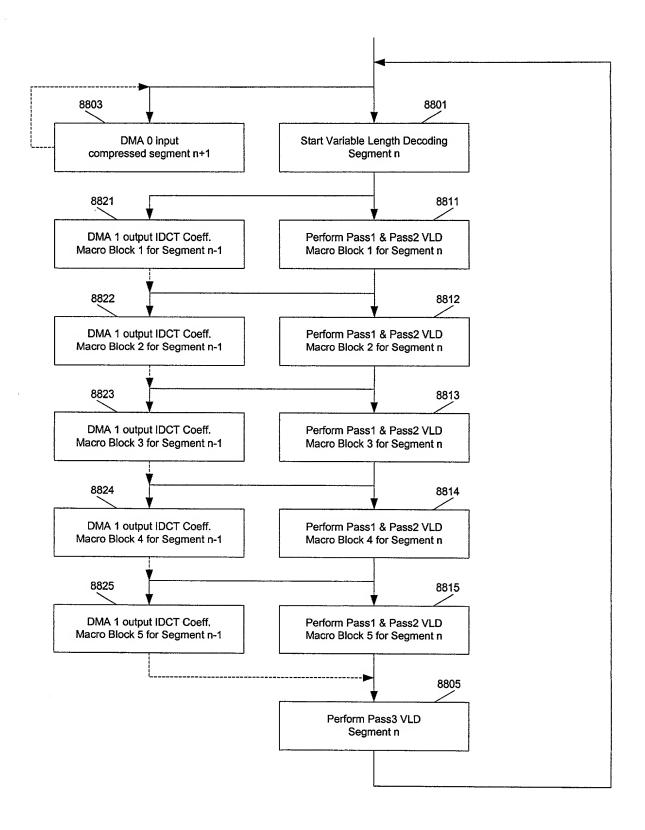


Fig. 68

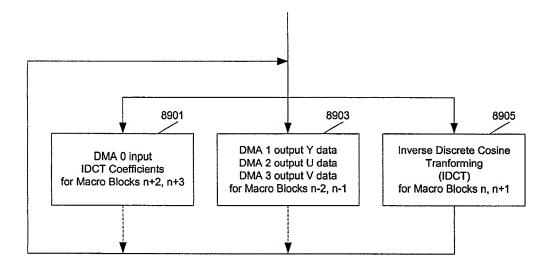


Fig. 69

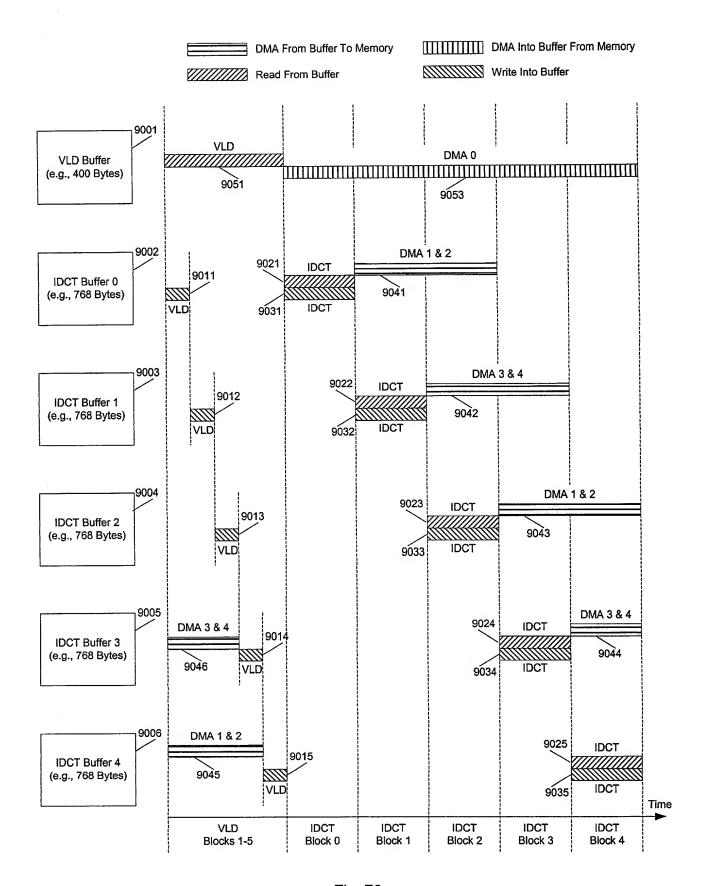


Fig. 70

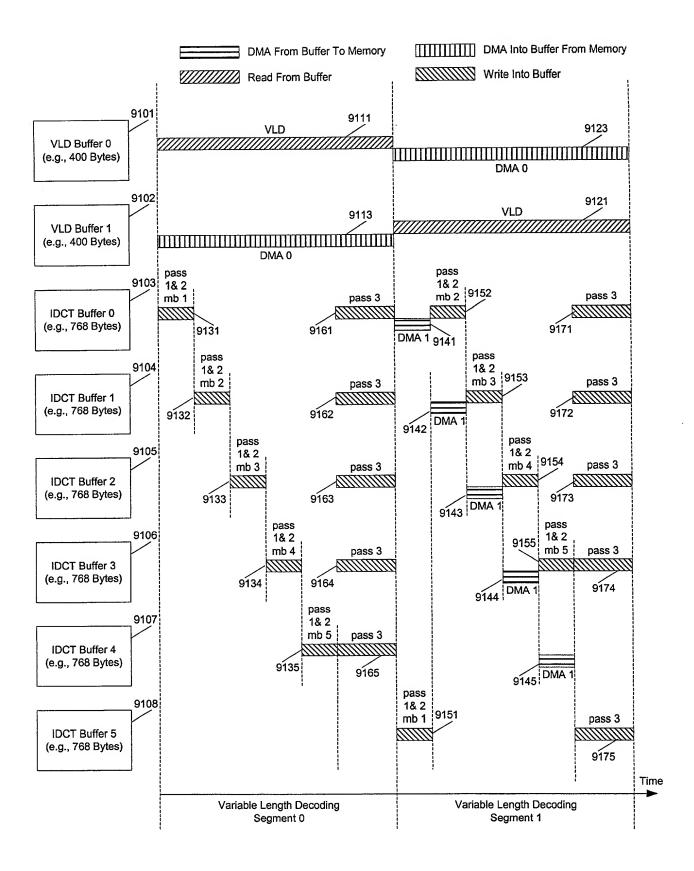


Fig. 71

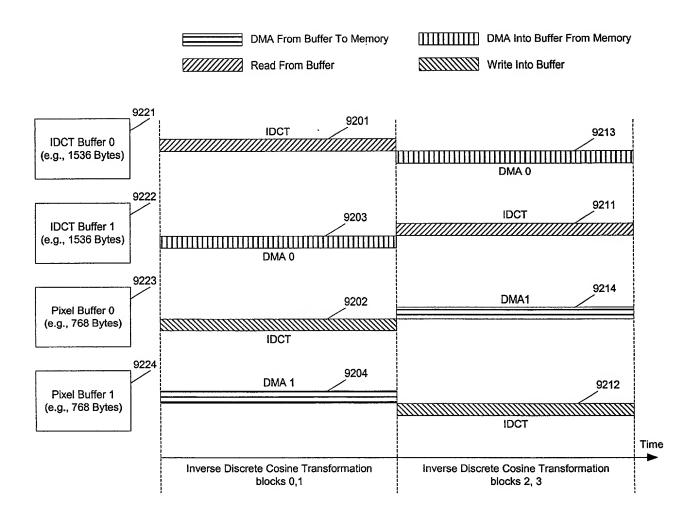


Fig. 72

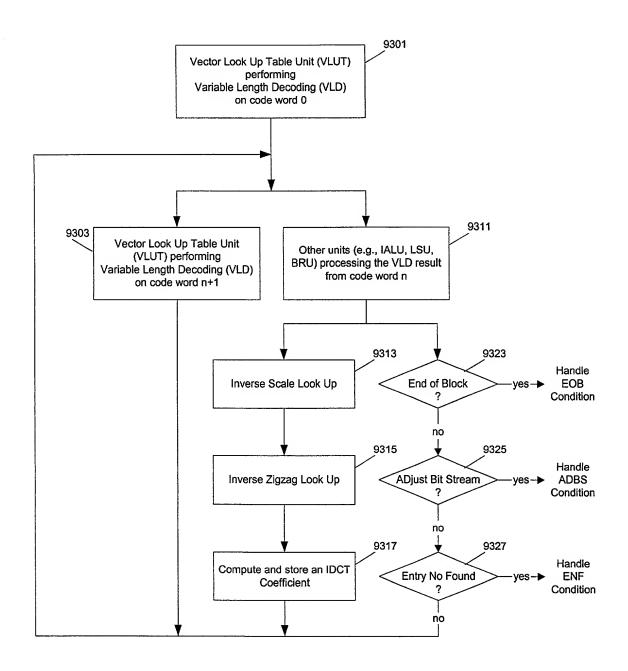
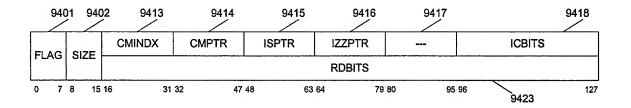


Fig. 73



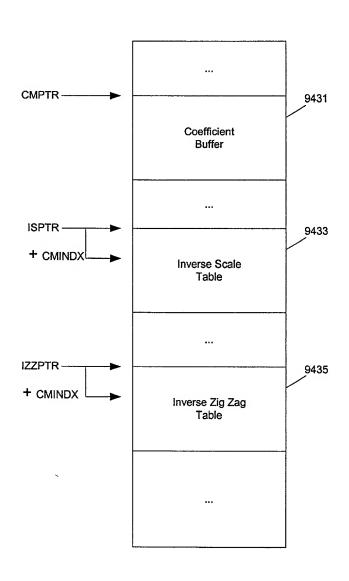


Fig. 74

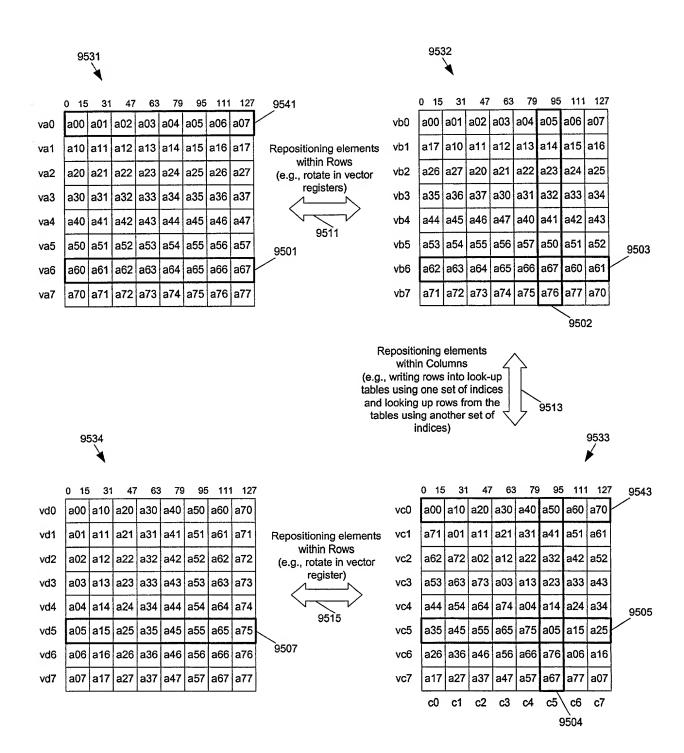
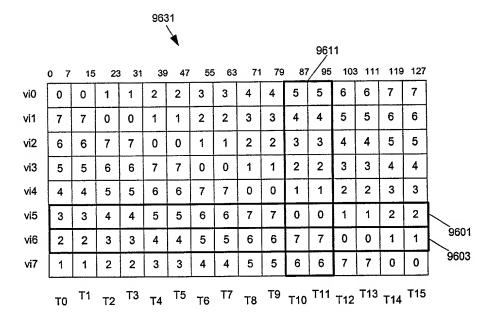


Fig. 75



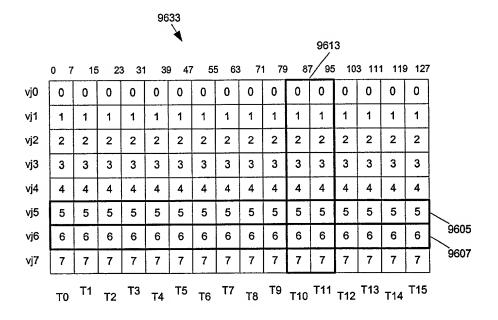


Fig. 76

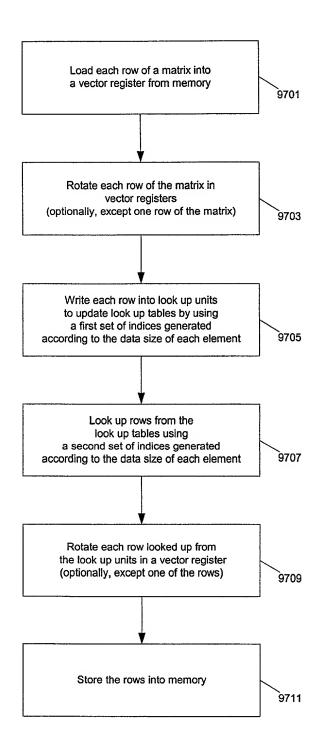


Fig. 77

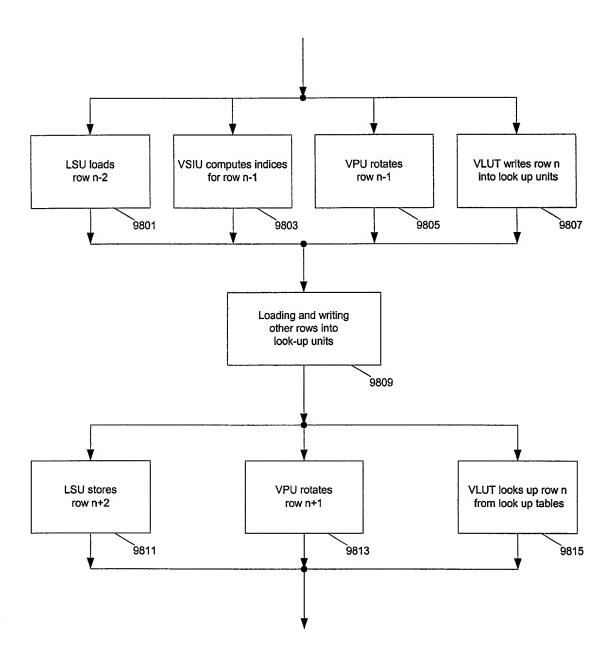


Fig. 78

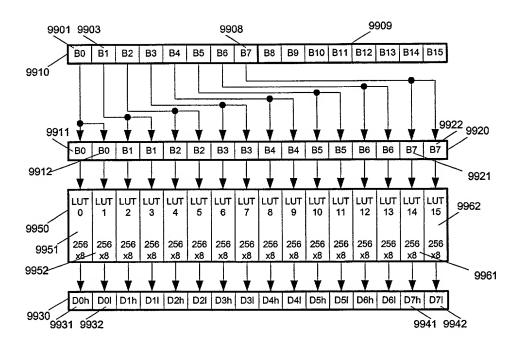


Fig. 79

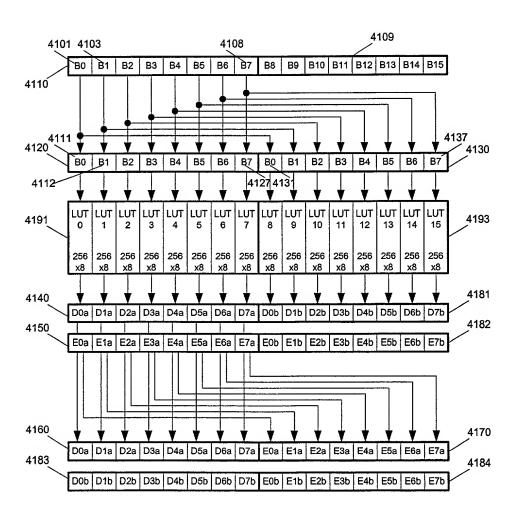


Fig. 80

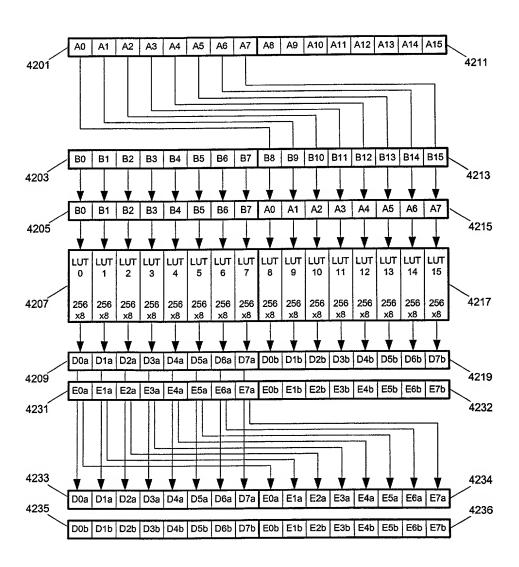


Fig. 81

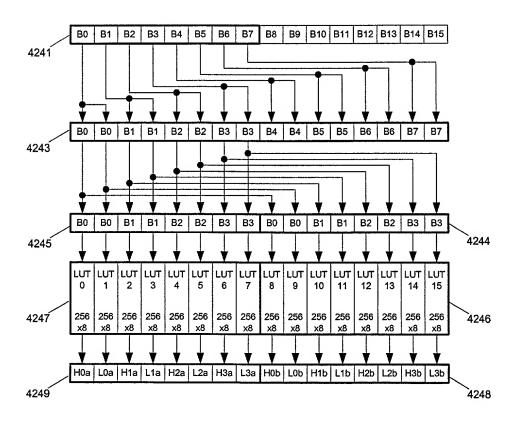


Fig. 82

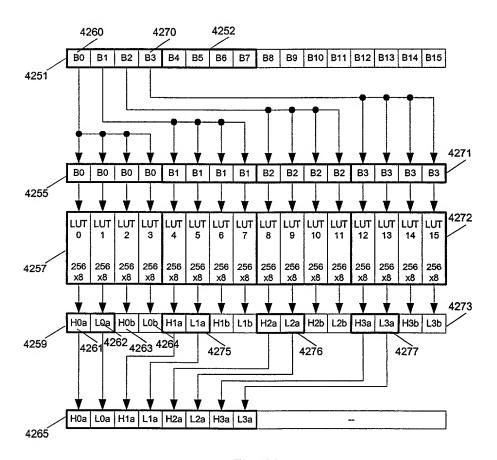


Fig. 83

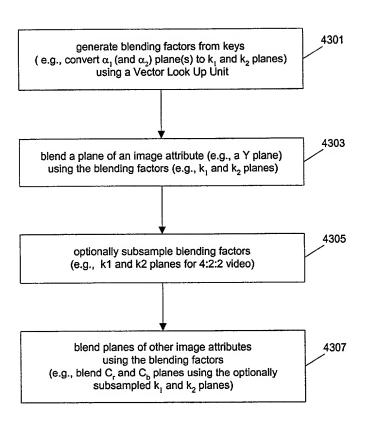


Fig. 84

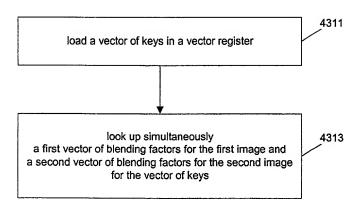


Fig. 85

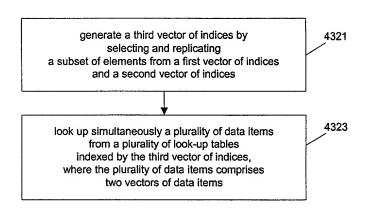


Fig. 86

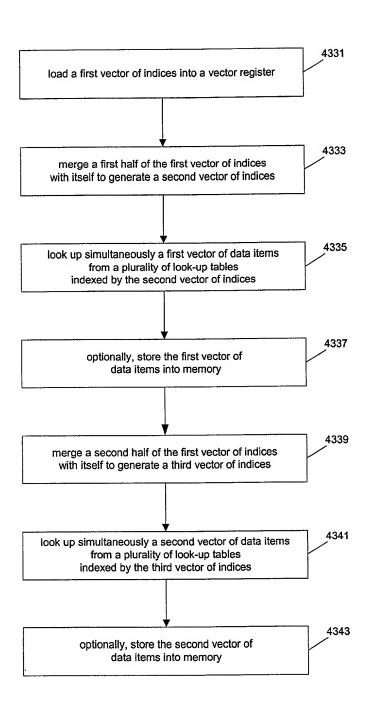


Fig. 87

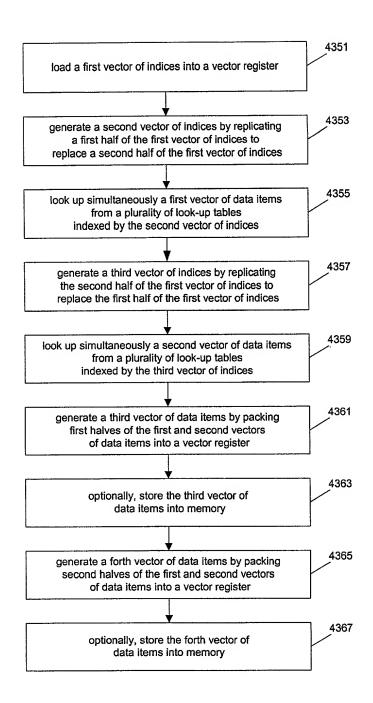


Fig. 88

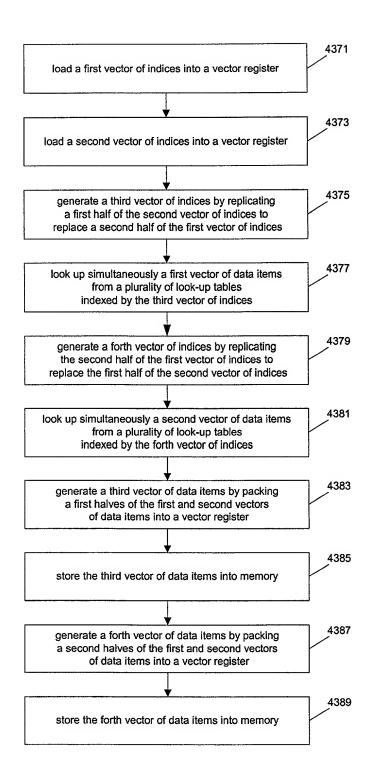


Fig. 89

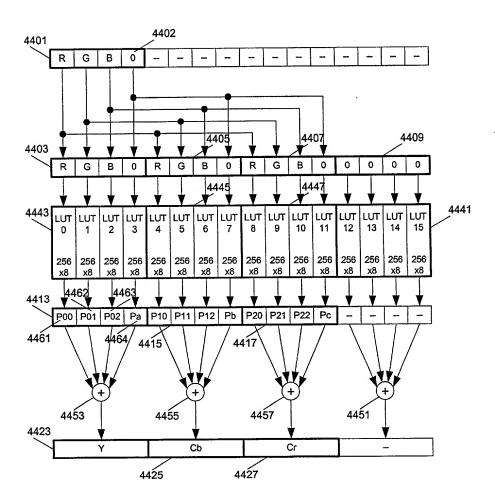


Fig. 90

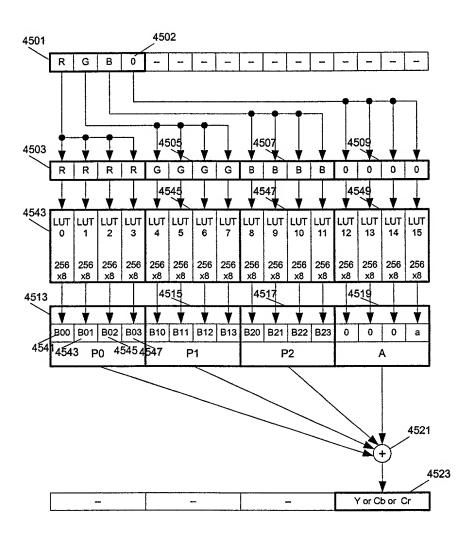


Fig. 91

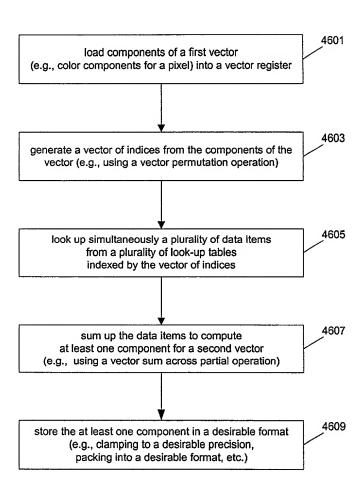


Fig. 92

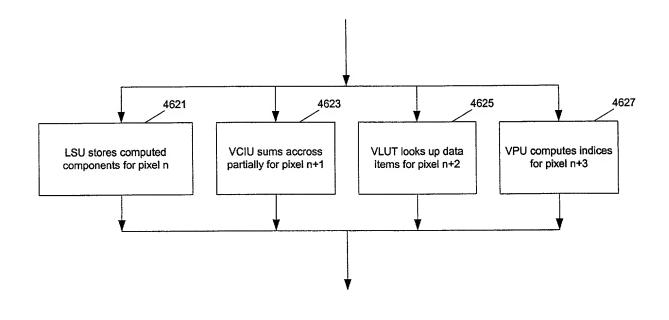
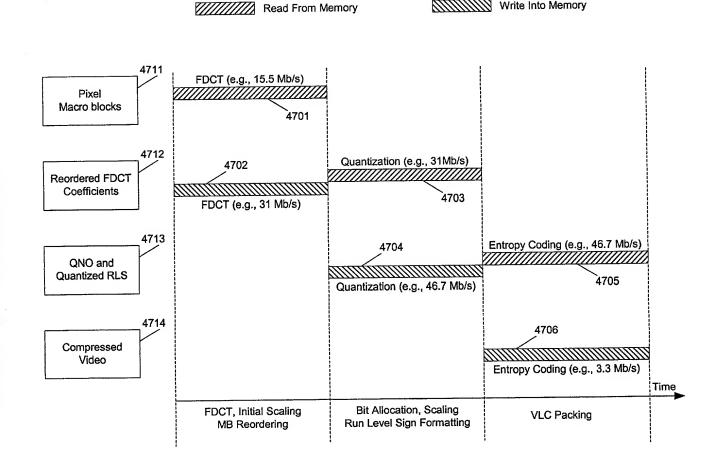


Fig. 93



Write Into Memory

Fig. 94

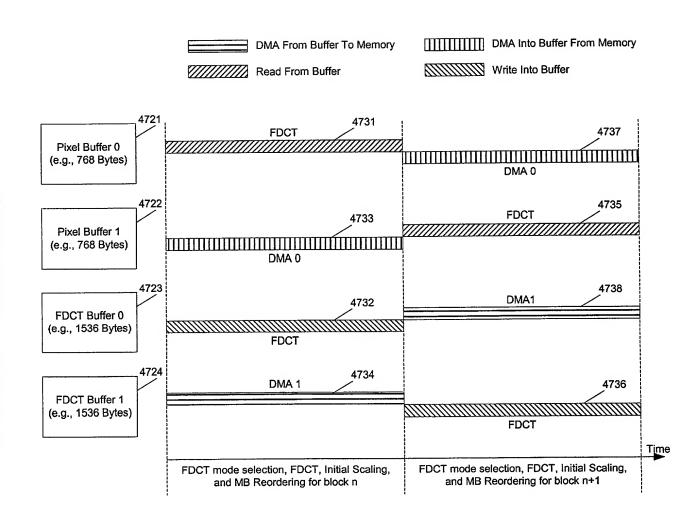
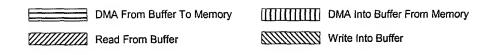


Fig. 95



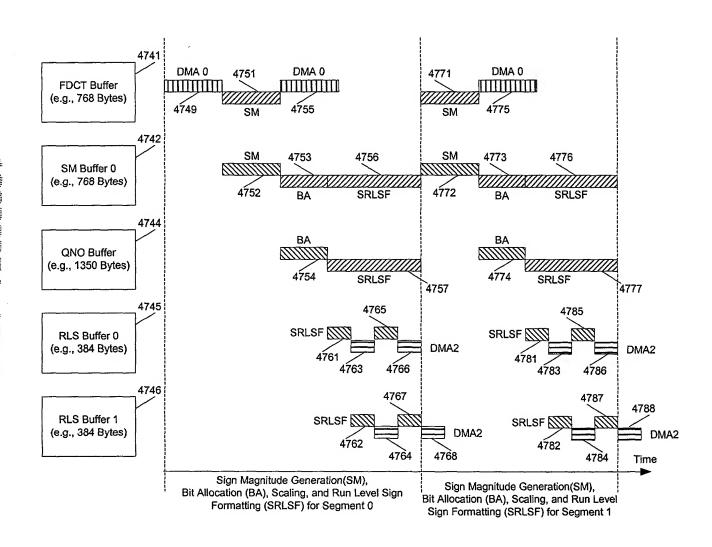


Fig. 96

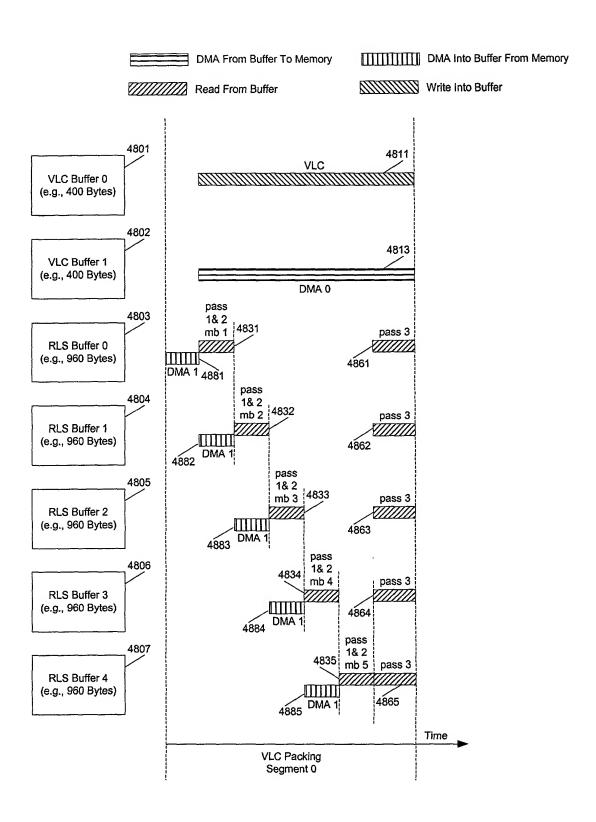


Fig. 97